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New Nouveau
Brunswick

Natural Resources and Energy
Minerals and Energy Division

AN ANNOTATED BIBLIOGRAPHY OF SURFICIAL GEOLOGY (REGOLITH) MAPPING, AND INVESTIGATIONS OF GLACIAL GEOLOGY IN NEW BRUNSWICK (INCLUDING TILL AND SOIL GEOCHEMISTRY STUDIES)

A.A. Seaman (compiler)

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Minister of Natural Resources and Energy

February, 2001

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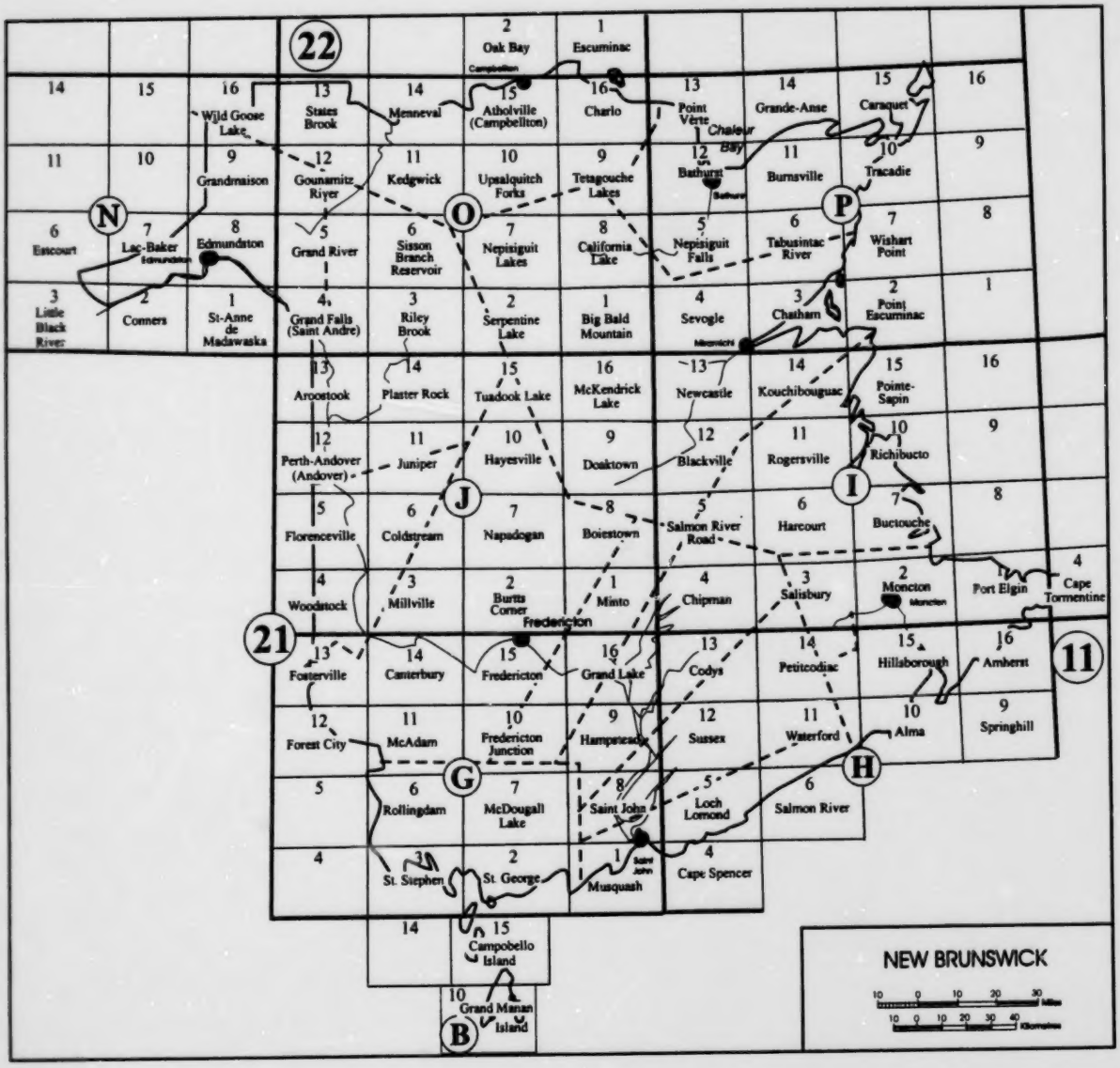

Figure 1. National Topographic System for New Brunswick / Le Système national de référence cartographique du Nouveau-Brunswick.

AN ANNOTATED BIBLIOGRAPHY OF SURFICIAL GEOLOGY (REGOLITH) MAPPING, AND INVESTIGATIONS OF GLACIAL GEOLOGY IN NEW BRUNSWICK (INCLUDING TILL AND SOIL GEOCHEMISTRY STUDIES)

NOTES

Reports or maps that provide provincial scale coverage are listed in the first section of this bibliography. Detailed reports and maps are listed by National Topographic System (NTS) 1:50 000 scale map areas, while reports and maps with more regional coverage are listed by NTS 1:250 000 scale map areas. The NTS map areas (Figure 1) are listed in alpha-numeric order, with the 1:250 000 scale NTS map area first, followed by the 1:50 000 scale NTS map areas that lie within it.

Entries, current to December 31, 2000, are listed in chronological order for each map area.

Till (or soil) geochemistry reports/maps are identified by the underlining of the authors' names.

No annotation is given when the report or map title is self-explanatory.

Citations do **not** include abstracts or unpublished university theses.

NOTES

Les rapports ou les cartes qui fournissent une couverture à l'échelle provinciale sont énumérés dans la première partie de la présente bibliographie. Les rapports et les cartes détaillés sont énumérés selon l'étendue cartographiée à l'échelle de 1/50 000 du Système national de référence cartographique (SNRC), tandis que les rapports et les cartes qui couvrent une plus grande région sont énumérés selon l'étendue cartographiée à l'échelle de 1/250 000. Les étendues cartographiées du SNRC (figure 1) sont énumérées par ordre alphanumérique; celles à l'échelle de 1/250 000 apparaissent en premier, suivies de celles à l'échelle de 1/50 000 qui sont comprises dans les premières.

Les cartes, actualisées au 31 décembre 2000, sont énumérées par ordre chronologique pour chaque étendue cartographiée.

Les rapports et les cartes géochimiques du till (ou sol) sont identifiées par le soulignement des noms des auteurs.

Aucune annotation n'est donnée lorsque le titre du rapport ou de la carte est explicite.

Les citations **ne comprennent pas** de résumés ni de thèses universitaires non publiées.

NEW BRUNSWICK (PROVINCIAL)

GESNER, A. 1841. Third Report on the Geological Survey of the Province of New-Brunswick. Henry Chubb, Saint John, New Brunswick, 88 p.

- *covers the southern half of New Brunswick*
- *includes comments on surficial deposits in the area*

GESNER, A. 1842. Fourth Report on the Geological Survey of the Province of New-Brunswick. Henry Chubb, Saint John, New Brunswick, 101 p.

- *covers the southern half of New Brunswick*
- *includes comments on surficial deposits in the area*

GESNER, A. 1843. Report on the Geological Survey of the Province of New-Brunswick with a Topographical Account of the Public Lands, and the Districts Explored in 1842. Henry Chubb, Saint John, New Brunswick, 88 p.

- *covers northern New Brunswick*
- *includes comments on surficial deposits in the area*

ROBB, J. 1851. Notice of observations on drift striae in New Brunswick. Proceedings of the American Association for the Advancement of Science, **4**: 349-351.

HIND, H.Y. 1865. A preliminary report on the geology of New Brunswick, together with a special report on the distribution of the "Quebec Group" in the Province. Journal of the Assembly of New Brunswick, Appendix 8, 293 p.

- *Chapter X, "Surface Geology", includes a discussion of the direction of ice flow in New Brunswick, and a brief table of observed striae sites*
- *Chapter XI deals with "Economic Materials in the Drift"*

DAWSON, J.W. 1868. Acadian Geology: The Geological Structure, Organic Remains, and Mineral Resources of Nova Scotia, New Brunswick, and Prince Edward Island; Second Edition. Macmillan and Co., London, 694 p.

- *Chapter V, "The post-Pliocene Period", discusses glacial geology*

MATTHEW, G.F. 1872. On the surface geology of New Brunswick. The Canadian Naturalist, New Series, **vi**: 89-107.

- *includes a discussion of drift striae, and a brief table of observed striae sites in southern New Brunswick*

MATTHEW, G.F. 1875. On the surface geology of New Brunswick. The Canadian Naturalist, New Series, **vii**: 433-454.

- *includes a table of observed striae sites in southern New Brunswick*
- *includes a discussion of various types of glacial deposits, and a brief table of observed glacial ridges in southern New Brunswick*

CHALMERS, R. 1885. Preliminary report on the surface geology of New Brunswick. Geological and Natural History Survey of Canada, Annual Report, **I**: Part GG, 58 p.

- *includes a table of observed striae sites, and descriptions of various types of glacial deposits*

STEAD, G. 1903. Notes on surface geology of New Brunswick. Bulletin of the Natural History Society of New Brunswick, **5**: Part 1, pp. 5-13.

RIES, H., and KEELE, J. 1911. The clay and shale deposits of Nova Scotia and portions of New Brunswick. Canada Department of Mines, Geological Branch, Memoir No. 16-E, 155 p.

- *includes a brief section on New Brunswick Pleistocene clays*
- *includes a section on "Drift or Boulder Clays" (i.e., glacial deposits)*

KEELE, J. 1914. Clay and shale deposits of New Brunswick. Canada Department of Mines, Geological Survey, Memoir 44, 94 p.

- *includes chapters on the "Origin and Nature of Clay", and "Pleistocene Clays"*

PREST, V.K., and GRANT, D.R. 1969. Retreat of the last ice sheet from the Maritime Provinces - Gulf of St. Lawrence region. Geological Survey of Canada, Paper 69-33, 15 p.

BIRD, J.B. 1972. The Natural Landscapes of Canada: A Study in Regional Earth Science. Wiley Publishers of Canada Ltd., Toronto, 191 p.

- *includes reference to some glacial phenomena in New Brunswick*

GRANT, D.R. 1975. Glacial style and the Quaternary stratigraphic record in the Atlantic Provinces, Canada. *In* Report of Activities, Part B. Geological Survey of Canada, Paper 75-1B, pp.109-110.

- *preliminary report and stratigraphic correlation*

HAMILTON, J.B., and CARROLL, D.J.J. 1975. Sand and gravel in New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Report of Investigation No.16, 107 p.

- *includes descriptions of the various surficial deposit types in New Brunswick*
- *accompanied by a 1:500 000 scale map of "Generalized surficial geology illustrating the distribution of granular resources in New Brunswick"*

GRANT, D.R. 1976. Late Wisconsinan ice limits in the Atlantic Provinces of Canada with particular reference to Cape Breton Island, Nova Scotia. *In* Report of Activities, Part C. Geological Survey of Canada, Paper 76-1C, pp. 289-292.

GRANT, D.R. 1976. Glacial style and the Quaternary stratigraphic record in the Atlantic Provinces, Canada. *In* Quaternary Stratigrapy of North America. *Edited by* W.C. Mahaney. Dowden, Hutchinson & Ross, Inc., Stroudsburg, PA, pp. 33-36.

- *preliminary report and stratigraphic correlation*

GRANT, D.R. 1977. Glacial style and ice limits, the Quaternary stratigraphic record, and changes of land and ocean level in the Atlantic Provinces, Canada. Géographie physique et Quaternaire, **XXXI**: 247-260.

GRANT, D.R., and KING, L.H. 1984. A stratigraphic framework for the Quaternary history of the Atlantic Provinces, Canada. *In* Quaternary Stratigraphy of Canada - A Canadian Contribution to IGCP Project 24. *Edited by* R.J. Fulton. Geological Survey of Canada, Paper 84-10, pp. 173-191.

RAMPTON, V.N., GAUTHIER, R.C, THIBAULT, J., and SEAMAN, A.A. 1984. Quaternary geology of New Brunswick. Geological Survey of Canada, Memoir 416, 77 p.

- *accompanied by a 1:500 000 scale map (Map 1594A) of the surficial geology of New Brunswick*

NEW BRUNSWICK DEPARTMENT OF NATURAL RESOURCES AND ENERGY. 1987. Atlas of granular aggregate resources, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Miscellaneous Report6, 90 p.

- *consists of simplified 1:100 000 scale summary granular aggregate resource maps for every 1:50 000 scale NTS map area in the province*
- *each summary map includes a cross reference to the original 1:50 000 scale granular aggregate map and the Open File Report that accompanied the map*

GRANT, D.R. 1989. Chapter 5: Quaternary geology of the Atlantic Appalachian region of Canada. *In* Quaternary Geology of Canada and Greenland. *Edited by* R.J. Fulton. Geological Survey of Canada, Geology of Canada No. 1, pp. 393-440.

SEAMAN, A.A. 1989. Glacial striae trends in New Brunswick: a compilation. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 89-34, 136 p.

- *a compilation of reported glacial striae trends obtained primarily from Quaternary or surficial geology maps and reports; granular aggregate inventory maps; Geological Survey of Canada annual reports; and bedrock geology maps published prior to 1989*
- *the striae orientations were compiled and reported for each 1:50 000 scale NTS map area*

PRONK, A.G., and RUITENBERG, A.A. 1991. Applications of surficial mapping to forest management in New Brunswick. Atlantic Geology, **27**: 209-212.

SEAMAN, A.A. 1991. Complex glacial ice-flow events in New Brunswick with particular reference to the Oromocto Lake area, and implications for drift prospecting. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Geoscience Report 89-2, 48 p.

- *accompanied by a 1:500 000 scale map (Plate 89-11) summarizing glacial ice-flow directions in New Brunswick*

11 L/4, Cape Tormentine

CHALMERS, R. 1895. Report on the surface geology of eastern New Brunswick, northwestern Nova Scotia and a portion of Prince Edward Island, to accompany ¼ sheet maps, No. 2 S.E., No. 5 S.W. and No. 4 N.W. Geological Survey of Canada, Annual Report, **VII** (1894): Part M, 149 p.

- *includes a comprehensive list of observed striae sites, including several from the New Brunswick part of the L/4 map area, and descriptions of various types of glacial deposits*
- *Map 4 N.W. includes the Cape Tormentine area*

AIRPHOTO ANALYSIS ASSOCIATES CONSULTANTS LIMITED. 1975. Beach resources, eastern New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report2, 215 p.

- *includes a section on surficial geology*
- *accompanied by a 1:1 000 000 scale map of the surficial geology of the coastal part of eastern New Brunswick*

SEAMAN, A.A. 1986. Granular aggregate resources of southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Open File Report 86-12, 84 p.

- *includes a brief section on surficial geology*
- *accompanied by a 1:50 000 scale map (Plate 86-217) outlining the aggregate resources of the New Brunswick part of the map area (no surficial aggregate deposits are present in the L/4 map area)*

21 B, EASTPORT
1:250 000 scale map area (regional)

CHALMERS, R. 1890. Report on the surface geology of southern New Brunswick, to accompany ¼ sheet maps 1 S.W., 1 S.E. and 1 N.E. Geological and Natural History Survey of Canada, Annual Report, IV (1888-1889): Part N, 92 p.

- *includes a comprehensive list of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 S.W. includes the New Brunswick part of the 21 B map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: report. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume III, 290 p.

- *includes a section on surficial geology*
- *accompanied by a 1:500 000 scale map of the surficial geology of the coastal part of southern New Brunswick*

21 B/10, Grand Manan Island

LEGGET, R.F. 1980. Glacial geology of Grand Manan Island, New Brunswick. Canadian Journal of Earth Sciences, **17**: 440-452.

GADD, N.R. 1981. Glacial geology of Grand Ma[illegible]sland, New Brunswick: discussion. Canadian Journal of Earth Sciences, **18**: 176.

LEGGET, R.F. 1981. Glacial geology of Grand Manan Island, New Brunswick: reply. Canadian Journal of Earth Sciences, **18**: 177.

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of ten 1:20 000 scale maps (map areas 64-70 and 72-74) cover the surficial geology of the coastal part of the B/10 map area*

SEAMAN, A.A. 1988. Granular aggregate resources, Grand Manan Island (NTS 21 B/10) and Campobello Island (NTS 21 B/15, B/14) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-3, 67 p.

- *includes a section on surficial geology*
- *Appendix C presents detailed descriptions of 9 surficial deposit sites and brief descriptions of 8 other such sites in the B/10 map area*
- *accompanied by a 1:50 000 scale map (Plate 87-5) outlining the surficial aggregate deposits of the map area*

21 B/15 & B/14, Campobello Island

LEGGET, R.F. 1980. Glacial geology of Grand Manan Island, New Brunswick. Canadian Journal of Earth Sciences, **17**: 440-452.

GADD, N.R. 1981. Glacial geology of Grand Manan Island, New Brunswick: discussion. Canadian Journal of Earth Sciences, **18**: 176.

LEGGET, R.F. 1981. Glacial geology of Grand Manan Island, New Brunswick: reply. Canadian Journal of Earth Sciences, **18**: 177.

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of ten 1:20 000 scale maps (map areas 56-64 and 71) cover the surficial geology of the coastal part of the B/15 & B/14 map area*

RUITENBERG, A.A., and McCUTCHEON, S.R. 1983. Bedrock, surficial and environmental geology of North Head, Grand Manan. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-1, 9 p.

- *includes a page-size 1:50 000 scale surficial geology map of the northern part of Grand Manan Island (that part lying within the B/15 map area) and a brief description of the surficial geology*

CHISWELL, P.G. 1987. Till geochemistry of southern Deer Island. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 87-12B.

- *1:20 000 scale map, with sampling at ~ 1 sample / km²*
- *analyses for Au (C-horizon panned concentrates, and humus samples); and Ag, Co, Cu, Pb, Sb, W and Zn [B-horizon, -80 mesh (<177 μm)]*

CHISWELL, P.G., and LONG, L.R. 1987. Surficial geology of southern Deer Island. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 87-12D.

- *1:20 000 scale map*

SEAMAN, A.A. 1988. Granular aggregate resources, Grand Manan Island (NTS 21 B/10) and Campobello Island (NTS 21 B/15, B/14) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-3, 67 p.

- *includes a section on surficial geology*
- *Appendices A, B and C present detailed descriptions of 12 surficial deposit sites and brief descriptions of 13 other such sites in the B/15 and B/14 map area*
- *accompanied by a 1:50 000 scale map (Plate 87-4) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 G, FREDERICTON
1:250 000 scale map area (regional)

GESNER, A. 1839. First Report on the Geological Survey of the Province of New Brunswick. Henry Chubb, Saint John, New Brunswick, 87 p.

- *covers southwestern New Brunswick, comprising the area to the south and west of the Saint John River*
- *includes comments on surficial deposits in the area*

MATHEW (sic), G.F. 1879. Report on the superficial geology of southern New Brunswick. Geological Survey of Canada, Report of Progress for 1877-78, Part EE, 36 p.

- *includes a table of observed striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1884. Report on the surface geology of western New Brunswick with special reference to the area included in York and Carleton counties. Geological and Natural History Survey of Canada, Report of Progress, 1882-1884, Part GG, 47 p.

- *includes a brief table of observed striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1890. Report on the surface geology of southern New Brunswick, to accompany ¼ sheet maps 1 S.W., 1 S.E. and 1 N.E. Geological and Natural History Survey of Canada, Annual Report, IV (1888-1889): Part N, 92 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 S.W. (1:253 440 scale) includes most of the southern half of the 21 G map area*
- *Maps 1 S.E. and 1 N.E. (1:253 440 scale) include the eastern 15% of the 21 G map area (approximately half the width of a 1:50 000 scale map area)*

CHALMERS, R. 1902. Report on the surface geology shown on the Fredericton and Andover quarter-sheet maps, New Brunswick. Geological Survey of Canada, Annual Report, **XII** (1899): Part M, 41 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 N.W. (Fredericton; 1:253 440 scale) includes most of the northern half of the 21 G map area*

GADD, N.R. 1970. Quaternary geology, southwest New Brunswick (21 G). *In* Report of Activities, Part A. Geological Survey of Canada, Paper 70-1A, pp.170-172.

- *preliminary report*

GADD, N.R. 1973. Quaternary geology of southwest New Brunswick with particular reference to Fredericton area. Geological Survey of Canada, Paper 71-34, 31 p.

- *accompanied by a 1:250 000 scale map (Map 12-1971) outlining the Quaternary geology of the New Brunswick part of the map area*

GADD, N.R. 1982. Comment on Late Wisconsinan glaciation models of northern Maine and adjacent Canada. Quaternary Research, 17: 410-412.

- *a reiteration of his interpretation of the glacial history of southwestern New Brunswick (in response to a misinterpretation presented in a paper on northern Maine)*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: report. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume III, 290 p.

- *includes a section on surficial geology*
- *accompanied by a 1:500 000 scale map of the surficial geology of the coastal part of southern New Brunswick*

KETTLES, I.M., and WYATT, P.H. 1985. Applications of till geochemistry in southwestern New Brunswick: acid rain sensitivity and mineral exploration. *In* Current Research, Part B. Geological Survey of Canada, Paper 85-1B, pp. 413-422.

- *covers the extreme northwest corner of the 21G map area (21G/13 and G/14)*
- *discusses carbonate and trace element distribution patterns in the area*
- *presents very small scale contoured maps of the study area for clay, silt and sand percentages, and for 14 trace elements*

THIBAULT, J., SEAMAN, A.A., and MOTT, R. 1985. Geomorphic features associated with deglaciation and marine submergence in southwest New Brunswick. Geological Association of Canada / Mineralogical Association of Canada, University of New Brunswick, Fredericton, New Brunswick, Excursion 7, 19 p.

- *includes a brief chapter on Quaternary geology*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for sites in the extreme northwest corner of the 21G map area*
- *sample spacing is irregular, based on road access*
- *accompanied by a 1:500 000 scale site location map*

SEAMAN, A.A. 1988. Quaternary stratigraphy of southern New Brunswick. *In* Thirteenth Annual Review of Activities, Project Resumes, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 87-89.

- *preliminary report*

SEAMAN, A.A. 1989. Quaternary stratigraphy; York, Sunbury, and Charlotte counties, New Brunswick. *In* Project Summaries for 1989: Fourteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 89-2, pp. 44-51.

- *presents a preliminary chronology of glacial events in southwestern New Brunswick, a discussion of till fabrics, and implications with respect to drift prospecting*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *covers the extreme northwestern corner of the area only*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

LAMOTHE, M. 1992. Pleistocene stratigraphy and till geochemistry of the Miramichi Zone, New Brunswick. Geological Survey of Canada, Bulletin 433, 58 p.

- *covers the extreme northwestern corner of the area only*
- *accompanied by colour plots of regional abundances of Cu, Hg, Pb, Sb, Sn, U, W and Zn in the clay fraction of tills (mud fraction for Sb)*

SEAMAN, A.A., BROSTER, B.E., CWYNAR, L.C., LAMOTHE, M., MILLER, R.F., and THIBAULT, J.J. 1993. Field guide to the Quaternary geology of southwestern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 93-1, 102 p.

- *includes a chapter on Quaternary geology, including a discussion of multiple glacial erosion events*

21 G/1, Musquash

CHALMERS, R. 1893. Height of the Bay of Fundy coast in the glacial period relative to sea-level, as evidenced by marine fossils in the boulder-clay at Saint John, New Brunswick. Bulletin of the Geological Society of America, 4: 361-370.

ALCOCK, F.J. 1938. Geology of Saint John region, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 216, 65 p.

- *includes a brief section on Pleistocene geology*

HAMILTON, J.B. 1973. Granular resources of the Lorneville area. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 73-1, 12 p.

- *includes a description of the surficial geology of the study area*
- *accompanied by a 1:25 000 scale map (Plate 73-3) outlining the surficial geology of the southern two-thirds of 21 G/1g*

RUITENBERG, A.A., BUTTIMER, S.M., and McCUTCHEON, S.R. 1975. Bedrock and surficial geology, east Musquash watershed. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-4, 22 p.

- *includes a page size map of the surficial geology of the watershed and a description of the surficial geology based on GADD (1973)*

LOHSE, H. 1977. Granular resources of Musquash map area, 21 G/1. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-2, 70 p.

- *includes a brief section on surficial geology*
- *appendix presents descriptions of 50 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 76-16) outlining the surficial aggregate deposits of the map area*

BÉLANGER, J.R. 1978. Surficial geology, Saint John, New Brunswick. Geological Survey of Canada, Open File 575. (also available as: New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 92-86.)

- *1:50 000 scale map of the Saint John metropolitan area, including the northeast quadrant of the G/1 map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of ten 1:20 000 scale maps (map areas 14-23) cover the surficial geology of the coastal part of the G/1 map area*

RAMPTON, V.N., GLEESON, C.F., THOMAS, R.D., and PARADIS, S. 1986. Geochemical exploration in areas of shallow till: some case histories. CIM Bulletin, 79: No. 896, pp. 67-74.

- *includes a summary of the results for the Eastern Saint George Batholith Project, subsequently detailed by THOMAS et al. (1987)*

THOMAS, R.D., GLEESON, C.F., RAMPTON, V.N., and RUITENBERG, A.A. 1987. Geochemistry and geology of surficial materials overlying part of the eastern Saint George batholith, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Report of Investigation 19, 26 p.

- *covers approximately 18km² in the northwestern corner of the map area*
- *sampled on a 1 km grid (1 sample / km²)*
- *accompanied by a 1:50 000 scale maps for Au (Plate 83-16), Sn (Plate 83-17) and W (Plate 83-18) in heavy mineral fractions from C-horizon material; and Ag (Plate 83-26), Co (Plate 83-23), Cu (Plate 83-22), Mo (Plate 83-21), Pb (Plate 83-19), Sb (Plate 83-24), U (Plate 83-25), and Zn (Plate 83-20) in B-horizon soils*
- *accompanied by a 1:50 000 scale map pebble lithology (Plate 83-27) and Quaternary deposits (Plate 83-28) maps*

NICKS, L.P. 1988. The study of the glacial stratigraphy and sedimentation of the Sheldon Point moraine, Saint John, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 91-12, 171 p.

- *a detailed investigation of the Sheldon Point moraine, with discussion of its regional context*

21 G/2, St. George

GADD, N.R. 1968. St. George map-area, New Brunswick. *In* Report of Activities, Part A. Geological Survey of Canada, Paper 68-1A, p. 161.

- *very brief preliminary report*

GADD, N.R. 1968. Surficial geology of the St. George (NTS 21G/2) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 96-4.

- *1:50 000 scale preliminary map*

RUITENBERG, A.A., BUTTIMER, S.M., and McCUTCHEON, S.R. 1975. Bedrock and surficial geology, east Musquash watershed. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-4, 22 p.

- *includes a page size map of the surficial geology of the watershed and a description of the surficial geology based on GADD (1973)*

CHANDRA, J. 1976. Seismic surveys carried out in Camp Utopia, Pennfield Ridge, Pocologan Station, Blagdon (Nerepis) and Rocky Brook (Pabineau) areas of New Brunswick in 1975 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-7, 35 p.

- *presents inferred seismic sections for the Pennfield-Utopia and Pocalogan delta complexes, with a brief description of the glacial geology*

FINAMORE, P.F. 1977. Granular resources in parts of the St. George (21 G/2) and McDougall Lake (21 G/7) map-areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-1, 145 p.

- *includes a brief section on surficial geology*
- *Appendix A presents descriptions of 109 surficial deposit sites in the G/2 map area*
- *accompanied by a 1:50 000 scale map (Plate 76-17) outlining the surficial aggregate deposits of approximately the eastern two-thirds of the map area*
- *this report is superseded by FINAMORE and SEAMAN (1988), below, for the G/2 map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of eleven 1:20 000 scale maps (map areas 5-13, 56 and 59) cover the surficial geology of the coastal part of the G/2 map area*

CHISWELL, P.G. 1987. Till geochemistry of the Mascarene Peninsula and northern Deer Island. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plates 87-12A.

- *1:20 000 scale map of the southwest quadrant of the G/2 map area, with sampling at ~ 1 sample / km²*
- *analyses for Au (C-horizon panned concentrates, and humus samples); and Ag, Co, Cu, Pb, Sb, W and Zn [B-horizon, -80 mesh (<177 μm)]*

CHISWELL, P.G., and LONG, L.R. 1987. Surficial geology of the Mascarene Peninsula and northern Deer Island. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plates 87-12C.

- *1:20 000 scale map of the southwest quadrant of the G/2 map area*

RAMPTON, V.N., GLEESON, C.F., THOMAS, R.D., and PARADIS, S. 1986. Geochemical exploration in areas of shallow till: some case histories. CIM Bulletin, **79**: No. 896, pp. 67-74.

- *includes a summary of the results for the Eastern Saint George Batholith Project, subsequently detailed by THOMAS et al. (1987)*

THOMAS, R.D., GLEESON, C.F., RAMPTON, V.N., and RUITENBERG, A.A. 1987. Geochemistry and geology of surficial materials overlying part of the eastern Saint George batholith, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Report of Investigation 19, 26 p.

- *covers approximately 30 km² in the northeastern corner of the map area*
- *sampled on a 1 km grid (1 sample / km²)*
- *accompanied by 1:50 000 scale maps for Au (Plate 83-16), Sn (Plate 83-17) and W (Plate 83-18) in heavy mineral fractions from C-horizon material; and Ag (Plate 83-26), Co (Plate 83-23), Cu (Plate 83-22), Mo (Plate 83-21), Pb (Plate 83-19), Sb (Plate 83-24), U (Plate 83-25), and Zn (Plate 83-20) in B-horizon soils*
- *accompanied by 1:50 000 scale pebble lithology (Plate 83-27) and Quaternary deposits (Plate 83-28) maps*

FINAMORE, P.F., and SEAMAN, A.A. 1988. Granular aggregate resources, St. George (NTS 21 G/2) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-2, 105 p.

- *includes a brief section on surficial geology*
- *appendices present detailed descriptions of 56 surficial deposit sites and brief descriptions of 69 others*
- *accompanied by a 1:50 000 scale map (Plate 87-3) outlining the surficial aggregate deposits of the map area*

21 G/3, St. Stephen

GADD, N.R. 1969. St-Stephen, New Brunswick. *In* Report of Activities, Part A. Geological Survey of Canada, Paper 69-1A, pp.195-196.

- *brief preliminary report*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of five 1:20 000 scale maps (map areas 1-5) cover the surficial geology of the coastal part of the G/3 map area*

THIBAULT, J. 1982. Granular aggregate resources of Rollingdam (NTS 21 G/6) and St. Stephen (NTS 21 G/3). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-15, 88 p.

- *includes a section on surficial geology*
- *Appendix C presents descriptions of 23 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 82-162) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

RUITENBERG, A.A. 1983. Bedrock, surficial and environmental geology, Town of St. Andrews, N.B. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-5, 11 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:21 500 scale surficial geology map (Plate 83-40)*

21 G/6, Rollingdam

THIBAULT, J. 1982. Granular aggregate resources of Rollingdam (NTS 21 G/6) and St. Stephen (NTS 21 G/3). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-15, 88 p.

- *includes a section on surficial geology*
- *Appendix B presents descriptions of 27 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 82-163) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

CHISWELL, P.G. 1987. Surficial geology and geochemistry, Rollingdam area. *In* Twelfth Annual Review of Activities, Project Résumés, 1987. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 87-2, pp. 51-53.

- *brief preliminary report, with a page-size map for the eastern half of the map area*

CHISWELL, P.G. 1988. Surficial geology and geochemistry, Rollingdam area. *In* Thirteenth Annual Review of Activities, Project Résumés, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 52-55.

- *brief preliminary report, with a page-size map of the map area*

CHISWELL, P.G., and LONG, L.R. 1989. Surficial geology of the Rollingdam map area (NTS 21 G/6), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 88-15A.

- *1:50 000 scale map*

CHISWELL, P.G., and LONG, L.R. 1989. Au, Ag, Sb, As, Cu, Pb, Zn and Bi values in till, Rollingdam map area (NTS 21 G/6), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 88-15B.

- *sampled on a 2 km grid (1 sample / 4 km^2)*
- *Au analyses on the -250 mesh (<62 μm) fraction of C-horizon material; other analyses on the -80 mesh (<177 μm) fraction of B-horizon soils*

CHISWELL, P.G., and LONG, L.R. 1989. Mo, W, Co, Ni, V, Fe and Mn values in till, Rollingdam map area (NTS 21 G/6), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 88-15C.

- *sampled on a 2 km grid (1 sample / 4 km^2)*
- *analyses on -80 mesh (<177 μm) fraction of B-horizon soils*

CHISWELL, P.G., and LONG, L.R. 1989. Till pebble lithologies of the Rollingdam map area (NTS 21 G/6), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 88-15D.

- *sampled on a 2 km grid (1 sample / 4 km²)*

21 G/7, McDougall Lake

RIDDELL, J.E. 1966. Geochemical dispersion patterns in soils at Mount Pleasant Mines, Charlotte County, New Brunswick. *In* Symposium on Geochemical Prospecting. *Edited by* E.M. Cameron. Geological Survey of Canada, Paper 66-54, pp. 233-247.

- *discussion of detailed soil geochemical investigations in an area of about 5 km² around the Mount Pleasant minesite*

RUITENBERG, A.A., BUTTIMER, S.M., and McCUTCHEON, S.R. 1975. Bedrock and surficial geology, east Musquash watershed. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-4, 22 p.

- *report includes a page size map of the surficial geology of the watershed and a description of the surficial geology based on GADD (1973)*

SZABO, N.L., GOVETT, G.J.S., and LAJTAI, E.Z. 1975. Dispersion trends of elements and indicator pebbles in glacial till around Mt. Pleasant, New Brunswick, Canada. Canadian Journal of Earth Sciences, **12**: 1534-1556.

- *a study of glacial dispersal of till pebbles and Cu, Pb, Zn, As and Sn in the Mount Pleasant area*
- *includes a page size surficial geology map for most of the G/7 map area, and a brief description of the surficial geology of the area*

FINAMORE, P.F. 1977. Granular resources in parts of the St. George (21 G/2) and McDougall Lake (21 G/7) map-areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-1, 145 p.

- *includes a brief section on surficial geology*
- *Appendix A presents descriptions of 8 surficial deposit sites in the G/7 map area*
- *accompanied by a 1:50 000 scale map (Plate 76-18) outlining the surficial aggregate deposits of approximately the southeast quadrant of the map area*
- *this report is superseded by THIBAULT (1983), below, for the G/7 map area*

THIBAULT, J. 1983. Granular aggregate resources of McDougall Lake (N.T.S. 21 G/7). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-6, 58 p.

- *includes a brief section on surficial geology*
- *appendices present detailed descriptions of 31 surficial deposit sites and brief descriptions of 33 others*
- *accompanied by a 1:50 000 scale map (Plate 83-30) outlining the surficial aggregate deposits of the map area*

THIBAULT, J. 1983. Surficial deposits of parts of the Fredericton Junction (21 G/10) and McDougall Lake (21 G/7) map areas. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-14, 15 p.

- *accompanied by a 1:50 000 scale map (Plate 84-33) covering the northern third of the McDougall Lake map area and the southern two-thirds of the Fredericton Junction map area, exclusive of the eastern ~7km*

RAMPTON, V.N., GLEESON, C.F., THOMAS, R.D., and PARADIS, S. 1986. Geochemical exploration in areas of shallow till: some case histories. CIM Bulletin, **79**: No. 896, pp. 67-74.

- *includes a summary of the results for the Eastern Saint George Batholith Project, subsequently detailed by THOMAS et al. (1987)*

THOMAS, R.D., GLEESON, C.F., RAMPTON, V.N., and RUITENBERG, A.A. 1987. Geochemistry and geology of surficial materials overlying part of the eastern Saint George batholith, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Report of Investigation 19, 26 p.

- *covers approximately the eastern quarter of the map area*
- *sampled on a 1 km grid (1 sample / km^2)*
- *accompanied by a 1:50 000 scale maps for Au (Plate 83-16), Sn (Plate 83-17) and W (Plate 83-18) in heavy mineral fractions from C-horizon material; and Ag (Plate 83-26), Co (Plate 83-23), Cu (Plate 83-22), Mo (Plate 83-21), Pb (Plate 83-19), Sb (Plate 83-24), U (Plate 83-25), and Zn (Plate 83-20) in B-horizon soils*
- *accompanied by a 1:50 000 scale map pebble lithology (Plate 83-27) and Quaternary deposits (Plate 83-28) maps*

ROSE, D.G. 1991. Tin-bearing float discovery, Mount Pleasant area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 91-31.

- *documents the location of an angular float bearing 21% Sn, that was discovered to the southwest of the True Hill and Mount Pleasant Sn occurrences*
- *plotted on a 1:50 000 scale bedrock map for part of the northwest corner of the G/7 map area*

21 G/8, Saint John

ALCOCK, F.J. 1938. Geology of Saint John region, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 216, 65 p.

- *includes a brief section on Pleistocene geology*

RUITENBERG, A.A., BUTTIMER, S.M., and McCUTCHEON, S.R. 1975. Bedrock and surficial geology, east Musquash watershed. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-4, 22 p.

- *report includes a page size map of the surficial geology of the watershed and a description of the surficial geology based on GADD (1973)*

CHANDRA, J. 1976. Seismic surveys carried out in Camp Utopia, Pennfield Ridge, Pocologan Station, Blagdon (Nerepis) and Rocky Brook (Pabineau) areas of New Brunswick in 1975 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-7, 35 p.

- *presents inferred seismic sections for the Blagdon kame delta, with a brief description of the glacial geology*

THIBAULT, J., FINAMORE, P., and LOHSE, H. 1976. Granular resources of Saint John map area, 21 G/8. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-13, 74p.

- *includes a section on surficial geology*
- *appendix presents descriptions of 49 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 76-19) outlining the surficial aggregate deposits of the map area*

BÉLANGER, J.R. 1978. Surficial geology, Saint John, New Brunswick. Geological Survey of Canada, Open File 575. (also available as: New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 92-86.)

- *1:50 000 scale map of the Saint John metropolitan area, including the southeast quadrant of the G/8 map area*

RUITENBERG, A.A., and THIBAULT, J. 1981. Bedrock, surficial and environmental geology, Village of Westfield, N.B. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 81-32, 11 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a small 1:50 000 scale surficial geology map*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *one 1:20 000 scale map (map area 22) covers the surficial geology of the area around Saint John Harbour*

RAMPTON, V.N., GLEESON, C.F., THOMAS, R.D., and PARADIS, S. 1986. Geochemical exploration in areas of shallow till: some case histories. CIM Bulletin, **79**: No. 896, pp. 67-74.

- *includes a summary of the results for the Eastern Saint George Batholith Project, subsequently detailed by THOMAS et al. (1987)*

THOMAS, R.D., GLEESON, C.F., RAMPTON, V.N., and RUITENBERG, A.A. 1987. Geochemistry and geology of surficial materials overlying part of the eastern Saint George batholith, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Report of Investigation 19, 26 p.

- *covers approximately the western third of the map area, exclusive of the northeastern and southeastern corners*
- *sampled on a 1 km grid (1 sample / km^2)*
- *accompanied by 1:50 000 scale maps for Au (Plate 83-16), Sn (Plate 83-17) and W (Plate 83-18) in heavy mineral fractions from C-horizon material; and Ag (Plate 83-26), Co (Plate 83-23), Cu (Plate 83-22), Mo (Plate 83-21), Pb (Plate 83-19), Sb (Plate 83-24), U (Plate 83-25), and Zn (Plate 83-20) in B-horizon soils*
- *accompanied by 1:50 000 scale pebble lithology (Plate 83-27) and Quaternary deposits (Plate 83-28) maps*

21 G/9, Hampstead

BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Aggregate resources of the Sussex map-area (21 H/12) and part of the Hampstead map-area (21 G/9E) including surficial geology of Sussex East (21 H/12E). New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-8, 115 p.

- *includes a chapter on surficial geology*
- *appendix presents descriptions of 7 surficial deposit sites in the G/9 map area*
- *accompanied by a 1:50 000 scale map (Plate 76-21) outlining the surficial aggregate deposits of the area to the east of the Saint John River only*
- *this report is superseded by SEAMAN (1988), below, for the G/9 map area*

SEAMAN, A.A. 1988. Granular aggregate resources, Hampstead (NTS 21 G/9) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-4, 53 p.

- *includes a brief section on surficial geology*
- *appendix presents detailed descriptions of 14 surficial deposit sites and brief descriptions of 6 others*
- *accompanied by a 1:50 000 scale map (Plate 87-6) outlining the surficial aggregate deposits of the map area*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (SheetD). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331D.

- *1:10 000 scale map, covering the northeast-central part of the G/9 map area and the northwest-central part of the H/12 map area*
- *a compilation of sample results reported by BP Resources Canada Ltd., Imperial Oil Ltd., Maritime Resource Research, PGE Resources Ltd. and Texas Gulf Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet E). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331E.

- *1:10 000 scale map, covering the southeast-central part of the G/9 map area and the southwest-central part of the H/12 map area*
- *a compilation of sample results reported by Corona Corp., Imperial Oil Ltd. and PGE Resources Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

21 G/10, Fredericton Junction

THIBAULT, J. 1981. Granular aggregate resources of Fredericton Junction (NTS 21 G/10). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 81-5, 67 p.

- *includes a chapter on surficial geology*
- *appendix presents descriptions of 35 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 81-42) outlining the surficial aggregate deposits of the map area*

THIBAULT, J. 1983. Surficial deposits of parts of the Fredericton Junction (21 G/10) and McDougall Lake (21 G/7) map areas. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-14, 15 p.

- *accompanied by a 1:50 000 scale map (Plate 84-33) covering the northern third of the McDougall Lake map area and the southern two-thirds of the Fredericton Junction map area, exclusive of the eastern ~7km*

THIBAULT, J. 1985. Surficial geology of Fredericton Junction. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-13.

- *page-size 1:50 000 scale map of the municipal area*

21 G/11, McAdam

SEAMAN, A.A. 1982. Granular aggregate resources, McAdam (NTS 21 G/11) and Forest City (NTS 21 G/12). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-14, 101 p.

- *includes a chapter on surficial geology*
- *Appendix A presents descriptions of 32 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 82-164) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

SEAMAN, A. 1985. Surficial geology, Village of McAdam, N.B. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-6.

- *1:10 000 scale map of the municipal area*

SEAMAN, A.A., STUMPF, A.J., and BROSTER, B.E. 1994. Till sampling of the McAdam (NTS 21 G/11) map area, York County, New Brunswick. *In* Current Research 1993. *Compiled and Edited by* S.A.A.Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 12, pp.177-183.

- *preliminary report*

STUMPF, A.J., SEAMAN, A.A., and BROSTER, B.E. 1995. Variability of till in the McAdam (NTS 21 G/11) map area, York County, New Brunswick. *In* Geoscience Research 1994. *Compiled and Edited by* J.P. Langton. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 15, pp. 65-69.

- *preliminary report*

STUMPF, A.J. 1995. Quaternary geology and dispersal patterns of the McAdam (21 G/11) map area, York County, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 95-5, 218 p.

- *describes the surficial geology of the map area, and presents geochemical data for 36 elements collected from 307 sites on a 2 km grid (1 sample / 4 km^2)*
- *includes 21 page-size contoured element-distribution maps (Appendix IV), grain size (Appendix II) and pebble lithology (Appendix III) data*

SEAMAN, A.A., STUMPF, A.J., and BELL, G. 1995. Au, Ag, As, Hg and Sb values in tills of the McAdam (NTS 21 G/11) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-13A.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

SEAMAN, A.A., STUMPF, A.J., and BELL, G. 1995. Cu, Pb, Zn, Co and Ni values in tills of the McAdam (NTS 21 G/11) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-13B.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

SEAMAN, A.A., STUMPF, A.J., and BELL, G. 1995. Mn, Fe, Sn, W, Th and U values in tills of the McAdam (NTS 21 G/11) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-13C.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

STUMPF, A.J., BROSTER, B.E., and SEAMAN, A.A. 1997. Lithological and geochemical dispersal in till: McAdam area, New Brunswick. Atlantic Geology, **33**: 31-42.

STUMPF, A.J., and SEAMAN, A.A. 1997. Surficial geology of the McAdam (NTS 21 G/11) map area, York County, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-4A.

- *1:50 000 scale map*

SEAMAN, A.A., and STUMPF, A.J. 1998. Ice-flow indicators in the McAdam (NTS 21 G/11) map area, York County, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-4B.

- *1:50 000 scale map of glacial striae, clast fabrics and drumlinoid features*

21 G/12, Forest City

SEAMAN, A.A. 1982. Granular aggregate resources, McAdam (NTS 21 G/11) and Forest City (NTS 21 G/12). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-14, 101 p.

- *includes a chapter on surficial geology*
- *Appendix B presents descriptions of 6 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 82-165) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

SEAMAN, A.A. 1990. Quaternary geology and till geochemistry of the Forest City map area (NTS 21 G/12), York County, New Brunswick. *In* Project Summaries for 1990: Fifteenth Annual Review of Activities. *Edited by* S.A.Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Information Circular 90-2, pp. 40-43.

- *preliminary report*

SEAMAN, A.A. 1992. Till geochemistry of part of the Forest City (NTS 21 G/12) map area, York County, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 92-6, 88 p.

- *presents geochemical data for 36 elements for C-horizon till samples collected from 95 sites (Appendix C), 9 of which lie just to the north of the map area boundary [in the Fosterville (NTS 21 G/13) map area]*
- *sampled on a 2 km grid (1 sample / 4 km²)*
- *includes 34 page-size contoured element-distribution maps (Appendix B), grain size and pebble lithology data (Appendix D), and 4 page-size maps of till-pebble major lithotype distributions*
- *includes chapters on Surficial Materials and Glacial History*

SEAMAN, A.A. 1993. Follow-up till geochemical results for the Forest City (NTS 21 G/12) map area, York County, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 93-8, 9 p.

- *presents geochemical (34 elements), grain size and till-pebble lithology data for 5 follow-up sample sites in the map area*

SEAMAN, A.A. 1993. Au, Ag, As, Hg and Sb values in tills of the Forest City (NTS 21G/12) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 93-320A.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1993. Cu, Pb, Zn, Co and Ni values in tills of the Forest City (NTS 21G/12) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 93-320B.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1993. Mn, Fe, Sn, W, Th and U values in tills of the Forest City (NTS 21G/12) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 93-320C.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1995. Till pebble dispersal patterns in the Forest City (NTS 21 G/12) and Fosterville (NTS 21 G/13) map areas, York and Carleton counties, New Brunswick. *In* Current Research 1994. *Compiled and Edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 18, pp. 213-223.

SEAMAN, A.A. 1999. Till geochemistry of the New Brunswick part of the Forest City (NTS 21 G/12) and Fosterville (NTS 21 G/13) map areas, York and Carleton counties: site and geochemical data. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-7, 67 p.

- *Appendix 1 presents site location and characterization, grain size and pebble lithology data for all of the sites sampled in the above noted DNRE till geochemistry maps and reports*
- *Appendix 2 presents geochemical data, for 37 elements, for the samples collected from the 293 sites*
- *data is in both digital and hard copy format*

21 G/13, Fosterville

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Fosterville (21 G/13) and Canterbury (21 G/14), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-4, 116 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 41 surficial deposit sites in the G/13 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-81) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 15 till sites and 2 glaciofluvial sites (plus grain size data for an additional glaciofluvial site) for the G/13 map area [these sites are misidentified as from 21 G/14 in the data list]*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 8 identifies the 53 till sample site locations in the G/13 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 11.5 km^2*

SEAMAN, A.A. 1993. Quaternary geology and till geochemistry of the Fosterville map area (NTS 21 G/13), York and Carleton Counties, New Brunswick. *In* Current Research. *Compiled and Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 93-1, pp. 147-151.

- *preliminary report*

SEAMAN, A.A. 1993. Preliminary report - Au, Ag, As, Hg, Sb and base metal values for till samples from the Fosterville (NTS 21 G/13) map area, York and Carleton counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 93-7, 28 p.

- *presents page-size contoured distribution maps for the five elements noted in the title plus Co, Cu, Fe, Mn, Ni, Pb, and Zn, based on 182 C-horizon till samples collected on a 2 km sample grid (1 sample / 4 km²)*

SEAMAN, A.A. 1994. Surficial geology (regolith) mapping and follow-up till and quartz-boulder sampling in the Fosterville (NTS 21 G/13) map area, York and Carleton counties, New Brunswick. *In* Current Research 1993. *Compiled and Edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 12, pp. 166-177.

SEAMAN, A.A. 1994. Follow-up till geochemistry, Fosterville (NTS 21 G/13) map area, York and Carleton counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 94-8, 26 p.

- *presents follow-up geochemical (Ag, As, Au, Co, Cu, Fe, Hg, Mn, Ni, Pb, Sb, and Zn), grain size and pebble lithology data for 26 till C-horizon samples*

SEAMAN, A.A., BELL, G., and WOOD, T.D. 1994. Au, Ag, As, Hg and Sb values in tills of the Fosterville (NTS 21 G/13) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 94-49A.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A., BELL, G., and WOOD, T.D. 1994. Cu, Pb, Zn, Co and Ni values in tills of the Fosterville (NTS 21 G/13) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 94-49B.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A., BELL, G., and WOOD, T.D. 1994. Mn, Fe, Sn, W, Th and U values in tills of the Fosterville (NTS 21 G/13) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 94-49C.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1995. Till pebble dispersal patterns in the Forest City (NTS 21 G/12) and Fosterville (NTS 21 G/13) map areas, York and Carleton counties, New Brunswick. *In* Current Research 1994. *Compiled and Edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 18, pp. 213-223.

SEAMAN, A.A. 1996. Till stratigraphy at the Dead Creek Pb-Zn-quartz float occurrence, southwestern New Brunswick: indications for a local source. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 96-10, 17 p.

- *includes geochemical data (Au, Ag, As, Hg, Sb, Cu, Pb, Zn, Fe, Mn, Co and Ni) for till and soil B-horizon samples from the float area*

SEAMAN, A.A. 1999. Till geochemistry of the New Brunswick part of the Forest City (NTS 21 G/12) and Fosterville (NTS 21 G/13) map areas, York and Carleton counties: site and geochemical data. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-7, 67 p.

- *Appendix 1 presents site location and characterization, grain size and pebble lithology data for all of the sites sampled in the above noted DNRE till geochemistry maps and reports*
- *Appendix 2 presents geochemical data, for 37 elements, for the samples collected from the 293 sites*
- *data is in both digital and hard copy format*

21 G/14, Canterbury

LEE, H.A. 1962. Surficial geology of Canterbury, Woodstock, Florenceville and Andover map-areas; York, Carleton and Victoria counties, New Brunswick (Parts of 21 G/14, 21 J/4, 21 J/5, and 21 J/12). Geological Survey of Canada, Paper 62-12, 8 p.

- *accompanied by a 1:63 360 scale map (Map 23-1962) outlining the surficial geology of approximately the northern quarter of the G/14 map area*

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Fosterville (21 G/13) and Canterbury (21 G/14), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-4, 116 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 56 surficial deposit sites in the G/14 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-82) outlining the surficial aggregate deposits of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 22 till sites and 1 glaciofluvial site in the G/14 map area*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the log for a borehole (3029) near Middle Southampton, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 9 identifies the 45 till sample site locations in the G/14 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 23.75 km^2*
- *most of the samples were from the northwestern corner of the map area*

BALZER, S.A. 1990. Quaternary geology of the Canterbury map area (NTS 21 G/14), York County, New Brunswick: preliminary report. *In* Project Summaries for 1990: Fifteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 90-2, pp. 44-45.

BALZER, S.A. 1991. Quaternary geology and dispersal patterns of the Canterbury map area (NTS 21 G/14), York County, New Brunswick. *In* Project Summaries for 1991: Sixteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 91-2, pp. 28-29.

- *preliminary report*

BROSTER, B.E., and SEAMAN, A.A. 1991. Glacigenic rafting of weathered granite: Charlie Lake, New Brunswick. Canadian Journal of Earth Sciences, **28**: 649-654.

BALZER, S.A. 1992. Quaternary geology and dispersal patterns of the Canterbury area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 92-5, 192 p.

- *presents C-horizon geochemical (33 elements), grain size and till-pebble lithology data for 273 sample sites, mostly tills*
- *sampled on a 2 km grid (1 sample / 4 km^2)*
- *describes the surficial geology of the map area, and discusses the glacial history*
- *accompanied by a 1:50 000 scale surficial geology map (Plate 92-68)*

BALZER, S.A., and BROSTER, B.E. 1994. Comparison of clast and matrix dispersal in till: Canterbury area, New Brunswick. Atlantic Geology, 30: 9-17.

BALZER, S.A., and SEAMAN, A.A. 1996. Au, Ag, As, Hg and Sb values in tills of the Canterbury (NTS 21 G/14) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 96-2A.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

BALZER, S.A., and SEAMAN, A.A. 1996. Cu, Pb, Zn, Co and Ni values in tills of the Canterbury (NTS 21 G/14) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 96-2B.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

BALZER, S.A., and SEAMAN, A.A. 1996. Mn, Fe, Sn, W, Th and U values in tills of the Canterbury (NTS 21 G/14) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 96-2C.

- *sampled on a 2 km grid (1 sample / 4 km^2)*

21 G/15, Fredericton

LEE, H.A. 1957. Surficial geology of Fredericton, York and Sunbury counties, New Brunswick. Geological Survey of Canada, Paper 56-2, 11 p.

- *accompanied by a 1:63 360 scale map (Map 2-1956)*

KINGSTON, P.W., and LOHSE, H. 1974. Surficial geology of the Fredericton area. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-132.

- *1:50 000 scale map of approximately the northern half of the G/15 map area and the southern third of the J/2 map area*

SEAMAN, A.A., and THIBAULT, J. 1981. Granular aggregate resources, Fredericton (NTS 21 G/15), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 81-27, 87 p.

- *includes a chapter on surficial geology*
- *appendix presents descriptions of 42 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 81-67) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for two boreholes (3032 and 3036) near Keswick, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction for both boreholes, and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction for borehole 3032*

21 G/16, Grand Lake

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix A presents descriptions of 12 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-30) outlining the surficial aggregate deposits of the map area*

21 H, AMHERST
1:250 000 scale map area (regional)

GESNER, A. 1840. Second Report on the Geological Survey of the Province of New Brunswick. Henry Chubb, Saint John, New Brunswick, 76 p.

- *covers southeastern New Brunswick*
- *includes comments on surficial deposits in the area*

MATHEW (sic), G.F. 1879. Report on the superficial geology of southern New Brunswick. Geological Survey of Canada, Report of Progress for 1877-78, Part EE, 36 p.

- *includes a table of observed striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1890. Report on the surface geology of southern New Brunswick, to accompany ¼ sheet maps 1 S.W., 1 S.E. and 1 N.E. Geological and Natural History Survey of Canada, Annual Report, **IV** (1888-1889): Part N, 92 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 S.E. (1:253 440 scale) includes the southern half of the 21 H map area*
- *Map 1 N.E. (1:253 440 scale) includes the western 60% of the northern half of the 21 H map area*

CHALMERS, R. 1895. Report on the surface geology of eastern New Brunswick, northwestern Nova Scotia and a portion of Prince Edward Island, to accompany ¼ sheet maps, No. 2 S.E., No. 5 S.W. and No. 4 N.W. Geological Survey of Canada, Annual Report, **VII** (1894): Part M, 149 p.

- *includes a comprehensive list of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 4 N.W. (1:253 440 scale) includes the eastern 40% of the New Brunswick part of the 21 H map area*

RAMPTON, V.N., and PARADIS, S. 1981. Quaternary geology of Amherst map area (21 H), New Brunswick. New Brunswick Department of Natural Resources, Mineral Development Branch, Map Report 81-3, 36 p.

- *accompanied by a 1:250 000 scale Quaternary geology map (Map 81-003)*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: report. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume III, 290 p.

- *includes a section on surficial geology*
- *accompanied by a 1:500 000 scale map of the surficial geology of the coastal part of southern New Brunswick*

SEAMAN, A.A. 1988. Quaternary stratigraphy of southern New Brunswick. *In* Thirteenth Annual Review of Activities, Project Resumes, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 87-89.

- *preliminary report*

FOISY, M., and PRICHONNET, G. 1991. A reconstruction of glacial events in southeastern New Brunswick. Canadian Journal of Earth Sciences, **28**: 1594-1612.

RAMPTON, V.N. 1992. A reconstruction of glacial events in southeastern New Brunswick: discussion. Canadian Journal of Earth Sciences, **29**: 1119-1121.

FOISY, M., and PRICHONNET, G. 1991. A reconstruction of glacial events in southeastern New Brunswick: reply. Canadian Journal of Earth Sciences, **29**: 1121-1123.

21 H/4, Cape Spencer

ALCOCK, F.J. 1938. Geology of Saint John region, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 216, 65 p.

- *includes a brief section on Pleistocene geology*

BÉLANGER, J.R. 1978. Surficial geology, Saint John, New Brunswick. Geological Survey of Canada, Open File 575. (also available as: New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 92-86.)

- *1:50 000 scale map of the Saint John metropolitan area, including the H/4 map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of five 1:20 000 scale maps (map areas 22-26) cover the surficial geology of the coastal part of the H/4 map area*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Copper (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23a.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Lead (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23b.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Zinc (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23c.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Gold-arsenic (Au in ppb, As in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23d.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Silver (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23e.

- *1:16 000 scale map*

PRONK, A.G. 1985. Surficial geology, Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-24.

- *1:16 000 scale map of the ~3 km wide southeast coastal strip of the H/4 map area and a small part of the adjoining H/5 map area*
- *includes pebble lithology data*

SEAMAN, A.A. 1987. Granular aggregate resources, Cape Spencer (NTS 21 H/4) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-4, 16 p.

- *includes a section on Quaternary geology*
- *appendix presents a detailed description of 1 surficial deposit site and brief descriptions of 7 others*
- *accompanied by a 1:50 000 scale map (Plate 87-7) outlining the surficial aggregate deposits of the map area*

21 H/5, Loch Lomond

ALCOCK, F.J. 1938. Geology of Saint John region, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 216, 65 p.

- *includes a brief section on Pleistocene geology*

FINAMORE, P.F., and LOHSE, H. 1977. Granular resources in the Loch Lomond map-area (N.T.S. 21H/5). New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-9, 101 p.

- *includes a section on surficial geology*
- *Appendix A presents descriptions of 77 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 76-22) outlining the surficial aggregate deposits of the map area*

BÉLANGER, J.R. 1978. Surficial geology, Saint John, New Brunswick. Geological Survey of Canada, Open File 575. (also available as: New Brunswick Department of Natural Resources and Energy, Mineral Resources, Plate 92-86.)

- *1:50 000 scale map of the Saint John metropolitan area, including the southwest quadrant of the H/5 map area*

RUITENBERG, A.A., and FINAMORE, P.F. 1979. Bedrock, surficial and environmental geology, Quispamsis Planning District - a preliminary report. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report 79-3, 8 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:25 000 scale surficial geology map (Plate 81-55)*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of seven 1:20 000 scale maps (map areas 22 and 26-31) cover the surficial geology of the coastal part of the H/5 map area*

THREE-D GEOCONSULTANTS LIMITED. 1982. Bedrock and surficial geology of the Village of Gondola Point, Kings County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-29, 11 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 500 scale surficial geology map (Plate 84-484)*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Copper (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23a.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Lead (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23b.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Zinc (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23c.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Gold-arsenic (Au in ppb, As in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23d.

- *1:16 000 scale map*

PRONK, A.G. 1985. Geochemistry of humus and B-horizons, Silver (in ppm), Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-23e.

- *1:16 000 scale map*

PRONK, A.G. 1985. Surficial geology, Cape Spencer - Black River area. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-24.

- *1:16 000 scale map of the ~3 km wide southeast coastal strip of the H/4 map area and a small part of the adjoining H/5 map area*
- *includes pebble lithology data*

21 H/6, Salmon River

FINAMORE, P.F., and LOHSE, H. 1977. Granular resources in the Loch Lomond map-area (N.T.S. 21H/5). New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-9, 101 p.

- *Appendix A includes descriptions of 2 surficial deposit sites from the H/6 map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of six 1:20 000 scale maps (map areas 31-36) cover the surficial geology of the coastal part of the H/6 map area*

SEAMAN, A.A. 1988. Granular aggregate resources, Waterford (NTS 21 H/11) and Salmon River (NTS 21 H/6) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-1, 86 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 5 surficial deposit sites and brief descriptions of 3 others*
- *accompanied by a 1:50 000 scale map (Plate 87-1) outlining the surficial aggregate deposits of the map area*

FOISY, M., and SEAMAN, A.A. 1989. Quaternary geology of the Waterford and Salmon River map areas; Kings, Saint John, and Albert counties, New Brunswick. *In* Project Summaries for 1989: Fourteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 89-2, pp. 52-54.

- *preliminary report*

21 H/10, Alma

GREINER, H. 1974. Geomorphology of the Fundy National Park, New Brunswick. Maritime Sediments, **10**: 36-45.

- *covers the southwest corner of the H/10 map area*
- *includes a section on glacial geology*

LOHSE, H. 1974. Surficial geology and granular resources of part of Alma West, 21 H/10 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-120.

- *1:50 000 scale mapping of the area around Waterside (the mouths of the West and Shepody rivers)*
- *includes marginal notes*

THIBAULT, J. 1978. Granular aggregate resources, Alma map-area, 21H/10. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 78-5, 34 p.

- *includes a brief section on surficial geology*
- *appendix presents descriptions of 21 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 76-110) outlining the surficial aggregate deposits of the map area*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of nine 1:20 000 scale maps (map areas 38-45 and 51) cover the surficial geology of the coastal part of the H/10 map area*

THIBAULT, J. 1985. Surficial geology of Alma. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-15.

- *page-size map (~1:58 800 scale) of the municipal area*

FOISY, M., and PRICHONNET, G. 1988. Glaciation and deglaciation in the northeastern part of the Caledonian Highlands, New Brunswick - glacial dispersal and mineral geochemistry of tills. *In* Thirteenth Annual Review of Activities, Project Résumés, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 90-92.

- *preliminary report*

FOISY, M. 1989. Géomorphologie glaciaire et stratigraphie Quaternaire sur le flanc nord-est des Calédoniennes; Nouveau-Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 89-51, 201 p.

- *includes an abstract in English*
- *presents page-size proportional dot (range) plots for As, Au, Co, Cu, Fe, Mn, Ni, Pb, Sb, and Zn for C-horizon till samples from 44 sites within the H/10 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6.5 km^2 of New Brunswick land area*
- *accompanied by a 1:50 000 scale map (Plate 89-294) outlining the surficial geology of the map area*

FOISY, M. 1990. Au, Ag, As, Hg, Sb, Cu, Pb, Zn, Mn, Fe, Co, Ni content in tills of Alma (21H/10) and part of Waterford (21H/11) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 90-34A.

- *1:50 000 scale map*

21 H/11, Waterford

GREINER, H. 1974. Geomorphology of the Fundy National Park, New Brunswick. Maritime Sediments, **10**: 36-45.

- *covers the southeast corner of the H/11 map area*
- *includes a section on glacial geology*

McCUTCHEON, S.R., and THIBAULT, J. 1981. Environmental geology of Sussex and Sussex Corner, New Brunswick. New Brunswick Department of Natural Resources, Geological Surveys Branch, Open File Report 81-29, 18 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 800 scale surficial geology map (Plate 82-177)*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of three 1:20 000 scale maps (map areas 36-38) cover the surficial geology of the coastal part of the H/11 map area*

CHISWELL, P.G. 1986. Surficial geology, Goose Creek. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-43.

- *1:20 000 scale map of the southeast corner of map area H/11*

CHISWELL, P.G. 1986. Goose Creek, till geochemistry, gold (humus and B-horizon) in ppb. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-44.

- *1:20 000 scale map*

CHISWELL, P.G. 1986. Goose Creek, till geochemistry, arsenic (B-horizon) in ppm. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-45.

- *1:20 000 scale map*

CHISWELL, P.G. 1986. Goose Creek, till geochemistry, silver (B-horizon) in ppm. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-46.

- *1:20 000 scale map*

CHISWELL, P.G. 1986. Goose Creek, till geochemistry, zinc (B-horizon) in ppm. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-47.

- *1:20 000 scale map*

CHISWELL, P.G. 1986. Goose Creek, till geochemistry, copper (B-horizon) in ppm. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Plate 86-48.

- *1:20 000 scale map*

SEAMAN, A.A. 1988. Granular aggregate resources, Waterford (NTS 21 H/11) and Salmon River (NTS 21 H/6) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 88-1, 86 p.

- *includes a section on surficial geology*
- *Appendix B presents detailed descriptions of 35 surficial deposit sites and brief descriptions of 5 others*
- *accompanied by a 1:50 000 scale map (Plate 87-2) outlining the surficial aggregate deposits of the map area*

FOISY, M. 1989. Géomorphologie glaciaire et stratigraphie Quaternaire sur le flanc nord-est des Calédoniennes; Nouveau-Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 89-51, 201 p.

- *includes an abstract in English*
- *presents page-size proportional dot (range) plots for As, Au, Co, Cu, Fe, Mn, Ni, Pb, Sb, and Zn for C-horizon till samples from 23 sites in the northeast corner of the H/11 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 3.5 km^2 of the area studied*
- *accompanied by a 1:50 000 scale map (Plate 89-295) outlining the surficial geology of the northeast corner of the map area (~34 km^2)*

FOISY, M., and SEAMAN, A.A. 1989. Quaternary geology of the Waterford and Salmon River map areas; Kings, Saint John, and Albert counties, New Brunswick. *In* Project Summaries for 1989: Fourteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 89-2, pp. 52-54.

- *preliminary report*

FOISY, M. 1990. Au, Ag, As, Hg, Sb, Cu, Pb, Zn, Mn, Fe, Co, Ni content in tills of Alma (21H/10) and part of Waterford (21H/11) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 90-34A.

- *1:50 000 scale map, covering the northeast corner of the H/11 map area*

MUNN, M.D. 1995. Till lithology and geochemistry in the Waterford area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 95-4, 170 p.

- *presents C-horizon geochemical (38 elements), grain size and till-pebble lithology data for 270 sample sites*
- *sampled on a 2 km grid (1 sample / 4 km²)*
- *includes page-size contoured element distribution maps for 25 elements*
- *describes the surficial geology of the map area, and discusses the glacial history*

PRONK, A.G., and MUNN, M. 1995. Till lithology, geochemistry, and glacial dispersal in the Waterford map area (NTS 21 H/11), New Brunswick. *In* Current Research 1994. *Compiled and edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 18, pp. 205-212.

- *a discussion of till pebble and elemental dispersal patterns*

MUNN, M.D., BROSTER, B.E., and PRONK, A.G. 1996. Geochemical dispersal in till: Waterford area, New Brunswick. Atlantic Geology, **32**: 269-279.

BROSTER, B.E., MUNN, M.D., and PRONK, A.G. 1997. Inferences on glacial flow from till clast dispersal, Waterford area, New Brunswick. Géographie physique et Quaternaire, **51**: 29-39.

PRONK, A.G. 1997. Surficial geology map of the Waterford area (NTS 21 H/11), Albert, Kings, and Saint John counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-33.

- *1:50 000 scale map*

21 H/12, Sussex

BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Aggregate resources of the Sussex map-area (21 H/12) and part of the Hampstead map-area (21 G/9E) including surficial geology of Sussex East (21 H/12E). New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-8, 115 p.

- *includes a chapter on surficial geology*
- *appendix presents descriptions of 72 surficial deposit sites in the H/12 map area*
- *accompanied by a 1:50 000 scale map (Plate 76-23) outlining the surficial aggregate deposits of the map area*
- *accompanied by a 1:50 000 scale map (Plate 76-119) outlining the surficial geology of the east half of the map area*

McCUTCHEON, S.R., and THIBAULT, J. 1981. Environmental geology of Sussex and Sussex Corner, New Brunswick. New Brunswick Department of Natural Resources, Geological Surveys Branch, Open File Report 81-29, 18 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 800 scale surficial geology map (Plate 82-177)*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (SheetA). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331A.

- *1:10 000 scale map, covering the south-central part of the H/13 map area and a small area in the north-central part of the H/12 map area*
- *a compilation of sample results reported by BP Resources Ltd., Corona Corp., Lac Minerals Ltd. and PGE Resources Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet B). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331B.

- *1:10 000 scale map, covering the north-central part of the H/12 map area*
- *a compilation of sample results reported by BP Resources Ltd., BP Resources Canada Ltd. and PGE Resources Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet C). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331C.

- *1:10 000 scale map, covering the northwestern part of the H/12 map area*
- *a compilation of sample results reported by Brunswick Mines and Smelting, Noranda Exploration Ltd. and PGE Resources Corp.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet D). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331D.

- *1:10 000 scale map, covering the northeast-central part of the G/9 map area and the northwest-central part of the H/12 map area*
- *a compilation of sample results reported by BP Resources Canada Ltd., Imperial Oil Ltd., Maritime Resource Research, PGE Resources Ltd. and Texas Gulf Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet E). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331E.

- *1:10 000 scale map, covering the southeast-central part of the G/9 map area and the southwest-central part of the H/12 map area*
- *a compilation of sample results reported by Corona Corp., Imperial Oil Ltd. and PGE Resources Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

21 H/13, Codys

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix B presents descriptions of 12 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-31) outlining the surficial aggregate deposits of the map area*

MAZEROLLE, J.M. 1993. B-horizon soil-geochemical anomalies, Annidale - Shannon area, New Brunswick (Sheet A). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-331A.

- *1:10 000 scale map, covering the south-central part of the H/13 map area and a small area in the north-central part of the H/12 map area*
- *a compilation of sample results reported by BP Resources Ltd., Corona Corp., Lac Minerals Ltd. and PGE Resources Ltd.*
- *presents data for Ag, As, Au, Bi, Cr, Cu, Ni, Pb, Sb and Zn*

21 H/14, Petitcodiac

BRINSMEAD, R.A. 1974. Surficial geology and granular resources of Petitcodiac East, 21 H/14 E. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-121.

- *1:50 000 scale mapping of approximately the northern quarter of the east half of the map area, and an area of about 25 km² around the village of Elgin in the southeastern part of the map area*

BRINSMEAD, R.A. 1977. Aggregate resources of Petitcodiac West map-area, 21H/14W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-7, 70 p.

- *includes a chapter on glacial history*
- *appendix presents descriptions of 41 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 77-39) outlining the surficial aggregate deposits of the west half of the map area*

THIBAULT, J. 1985. Surficial geology of Petitcodiac. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-14.

- *page-size map (1:50 800 scale) of the municipal area*

BRINSMEAD, R.A., and SEAMAN, A.A. 1987. Granular aggregate resources, Petitcodiac (NTS 21 H/14) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-1, 98 p.

- *includes a section on glacial geology*
- *Appendix A presents descriptions of 11 surficial deposit sites from the east half of the map area*
- *Appendix B reproduces the descriptions for the west half of the map area previously reported by BRINSMEAD (1977)*
- *accompanied by a 1:50 000 scale map (Plate 86-222) outlining the surficial aggregate deposits of the map area*

FOISY, M. 1989. Géomorphologie glaciaire et stratigraphie Quaternaire sur le flanc nord-est des Calédoniennes; Nouveau-Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 89-51, 201 p.

- *includes an abstract in English*
- *presents page-size proportional dot (range) plots for As, Au, Co, Cu, Fe, Mn, Ni, Pb, Sb, and Zn for C-horizon till samples, including 2 sites from the southeast corner of the H/14 map area*

ALLABY, G.M. 2000. Till provenance and glacial history of the Petitcodiac (NTS 21 H/14) map area, southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 2000-8, 217 p.

- *presents C-horizon geochemical (48 elements), grain size and till-pebble lithology data for 274 sample sites*
- *sampled on a 2 km grid (1 sample / 4 km^2)*
- *includes page-size contoured element distribution maps for 27 elements*
- *describes the surficial geology of the map area, and discusses the glacial history*

21 H/15, Hillsborough

BRINSMEAD, R.A. 1974. Surficial geology and granular resources of part of Hillsborough West, 21 H/15 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-123.

- *1:50 000 scale surficial geology of ~18 km^2 in the east-central part of the west half of the map area*

LOHSE, H. 1974. Surficial geology and granular resources of Hillsborough East, 21 H/15 E. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-122.

- *1:50 000 scale surficial geology map of the eastern half of the map area, exclusive of the area to the east of the Memramcook River*
- *includes marginal notes*

CHANDRA, J., BRINSMEAD, R., and BANCROFT, D. 1975. Seismic surveys carried out in northern, eastern and southern New Brunswick in 1974 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-11, 47 p.

- *presents a description of the surficial deposits in the Demoiselle Creek delta area, accompanied by a page size surficial geology map (~1:20 000 scale)*

RUITENBERG, A.A., and THIBAULT, J. 1980. Bedrock, surficial and environmental geology, Village of Dorchester, N.B. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report 80-3, 11 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 800 scale surficial geology map (Plate 81-53)*

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of seven 1:20 000 scale maps (map areas 45-51) cover the surficial geology of the coastal part of the H/15 map area*

SEAMAN, A.A. 1986. Granular aggregate resources of southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Open File Report 86-12, 84 p.

- *includes a brief section on surficial geology*
- *Appendix B presents detailed descriptions of 11 surficial deposit sites and brief descriptions of 13 others*
- *accompanied by a 1:50 000 scale map (Plate 86-218) outlining the surficial aggregate deposits of the map area*

FOISY, M., and PRICHONNET, G. 1988. Glaciation and deglaciation in the northeastern part of the Caledonian Highlands, New Brunswick - glacial dispersal and mineral geochemistry of tills. *In* Thirteenth Annual Review of Activities, Project Résumés, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 90-92.

- *preliminary report*

FOISY, M. 1989. Géomorphologie glaciaire et stratigraphie Quaternaire sur le flanc nord-est des Calédoniennes; Nouveau-Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 89-51, 201 p.

- *includes an abstract in English*
- *presents page-size proportional dot (range) plots for As, Au, Co, Cu, Fe, Mn, Ni, Pb, Sb, and Zn for C-horizon till samples from 66 sites within the H/15 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 12 km^2 (for the area to the west of the Petitcodiac River only)*
- *accompanied by a 1:50 000 scale map (Plate 89-293) outlining the surficial geology of the map area, exclusive of the area to the east of the Memramcook River*

FOISY, M. 1990. Au, Ag, As, Hg, Sb, Cu, Pb, Zn, Mn, Fe, Co, Ni content in tills of Hillsborough (21H/15) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 90-34B.

- *1:50 000 scale map*

21 H/16, Amherst

HUNTER and ASSOCIATES. 1982. Fundy coastal zone study: map atlas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 3, Volume IV, 209 p.

- *a series of seven 1:20 000 scale maps (map areas 49-55) cover the surficial geology of the coastal part of the H/16 map area*

SEAMAN, A.A. 1986. Granular aggregate resources of southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Open File Report 86-12, 84 p.

- *includes a brief section on surficial geology*
- *Appendix C presents detailed descriptions of 2 surficial deposit sites and brief descriptions of 5 others*
- *accompanied by a 1:50 000 scale map (Plate 86-219) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 I, MONCTON
1:250 000 scale map area (regional)

GESNER, A. 1840. Second Report on the Geological Survey of the Province of New-Brunswick. Henry Chubb, Saint John, New Brunswick, 76 p.

- *covers southeastern New Brunswick*
- *includes comments on surficial deposits in the area*

CHALMERS, R. 1888. Report on the surface geology of north-eastern New Brunswick, to accompany quarter-sheet maps 2 N.E. and 6 S.W. Geological and Natural History Survey of Canada, Annual Report, **III** (1887-88): Part N, 33 p.

- *includes a brief table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 2 N.E. (1:253 440 scale) includes the northern 10% of the New Brunswick part of the 21 I map area*

CHALMERS, R. 1890. Report on the surface geology of southern New Brunswick, to accompany ¼ sheet maps 1 S.W., 1 S.E. and 1 N.E. Geological and Natural History Survey of Canada, Annual Report, **IV** (1888-1889): Part N, 92 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 N.E. (1:253 440 scale) includes the western 60% of the southern 20% of the 21 I map area*

CHALMERS, R. 1895. Report on the surface geology of eastern New Brunswick, northwestern Nova Scotia and a portion of Prince Edward Island, to accompany ¼ sheet maps, No. 2 S.E., No. 5 S.W. and No. 4 N.W. Geological Survey of Canada, Annual Report, **VII** (1894): Part M, 149 p.

- *includes a comprehensive list of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 2 S.E. (1:253 440 scale) covers the western 60% of the 21 I map area, exclusive of the northern 10% and southern 20%*
- *Map 4 N.W. (1:253 440 scale) covers the southern 20% of the eastern 40% of the 21 I map area*
- *Map 5 S.W. (1:253 440 scale) covers the remainder of the eastern 40% of the 21 I map area*

AIRPHOTO ANALYSIS ASSOCIATES CONSULTANTS LIMITED. 1975. Beach resources, eastern New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 2, 215 p.

- *includes a section on "Surficial Geology"*
- *accompanied by a 1:1 000 000 scale map of the surficial geology of the coastal part of eastern New Brunswick*

RAMPTON, V.N., and PARADIS, S. 1981. Quaternary geology of Moncton map area (21 I), New Brunswick. New Brunswick Department of Natural Resources, Mineral Development Branch, Map Report 81-2, 31 p.

- *accompanied by a 1:250 000 scale Quaternary geology map (Map 81-002)*

21 I/1, Port Elgin

LOHSE, H. 1974. Surficial geology and granular resources of part of Port Elgin West, 21 I/1 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-124.

- *1:50 000 scale surficial geology map of a strip ~3-5 km wide along the Northumberland Strait coast, in the western half of the map area*
- *includes marginal notes*

SEAMAN, A.A. 1986. Granular aggregate resources of southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Open File Report 86-12, 84 p.

- *includes a brief section on surficial geology*
- *Appendix D presents detailed descriptions of 2 surficial deposit sites and brief descriptions of 3 others*
- *accompanied by a 1:50 000 scale map (Plate 86-220) outlining the surficial aggregate deposits of the map area*

21 I/2, Moncton

CARR, P.A. 1961. Ground-water resources of Moncton map-area, New Brunswick, 21 I/2, W 1/2. Geological Survey of Canada, Paper 61-14, 7 p.

- *includes a brief section on Quaternary geology*

HOBSON, G.D., and CARR, P.A. 1967. Hammer seismic survey, Moncton map-area, New Brunswick, 21 I/2. Geological Survey of Canada, Paper 65-43, 9 p.

- *includes brief sections on Surficial Geology and Thickness of Surficial Deposits*
- *accompanied by a 1:63 360 scale contoured bedrock topography map of the map area, from which local surficial deposit thicknesses can be estimated*

LOHSE, H. 1974. Surficial geology and granular resources of Moncton East, 21 I/2 E. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-125.

- *1:50 000 scale surficial geology map of the eastern half of the map area*
- *includes marginal notes*

LOHSE, H. 1974. Surficial geology and granular resources of Moncton West, 21 I/2 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-126.

- *1:50 000 scale surficial geology map of the western half of the map area*
- *includes marginal notes*

SEAMAN, A.A. 1986. Granular aggregate resources of southeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Open File Report 86-12, 84p.

- *includes a brief section on surficial geology*
- *Appendix E presents detailed descriptions of 2 surficial deposit sites and brief descriptions of 12 others*
- *accompanied by a 1:50 000 scale map (Plate 86-221) outlining the surficial aggregate deposits of the map area*

21 I/3, Salisbury

BRINSMEAD, R.A. 1974. Surficial geology and granular resources of Salisbury East, 21 I/3 E. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-127.

- *1:50 000 scale surficial geology map of the southern half of the eastern half of the map area*
- *includes marginal notes*

BRINSMEAD, R.A. 1974. Surficial geology and granular resources of Salisbury West, 21 I/3 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-128.

- *1:50 000 scale surficial geology map of the southern half of the western half of the map area*
- *includes marginal notes*

CHANDRA, J., BRINSMEAD, R., and BANCROFT, D. 1975. Seismic surveys carried out in northern, eastern and southern New Brunswick in 1974 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-11, 47 p.

- *presents a description of the surficial deposits in the North River esker area and the Thornes Brook area, accompanied by page size surficial geology maps (~1:23 000 scale and ~1:17 500 scale, respectively)*

RUITENBERG, A.A., and THIBAULT, J. 1980. Bedrock, surficial and environmental geology, Village of Salisbury, N.B. New Brunswick Department of Natural Resources, Geological Surveys Branch, Open File Report 80-10, 7 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 840 scale surficial geology map (Plate 81-57)*

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix C presents descriptions of 18 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-32) outlining the surficial aggregate deposits of the map area*

21 I/4, Chipman

DYER, W.S. 1926. Minto coal basin, New Brunswick. Canada Department of Mines, Geological Survey, Memoir 151, 42 p.

- *includes a brief section on glacial geology*

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix D presents descriptions of 6 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-33) outlining the surficial aggregate deposits of the map area*

21 I/5, Salmon River Road

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix E presents descriptions of 6 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-34) outlining the surficial aggregate deposits of the map area*

21 I/6, Harcourt

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix F presents descriptions of 4 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-35) outlining the surficial aggregate deposits of the map area*

21 I/7, Buctouche

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix G presents descriptions of 7 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-36) outlining the surficial aggregate deposits of the map area*

21 I/10, Richibucto

CHANDRA, J., BRINSMEAD, R., and BANCROFT, D. 1975. Seismic surveys carried out in northern, eastern and southern New Brunswick in 1974 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-11, 47 p.

- *presents a description of the surficial deposits in the Geddes Lake area (to the southwest of Plaine de St. Charles), accompanied by a page size surficial geology map (~1:17 000 scale)*

DAVIES, J.L., and SEAMAN, A.A. 1983. Bedrock and surficial geology, Rexton, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-9, 4 p.

- *report includes a brief description of the surficial geology of the municipal area*

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix H presents descriptions of 8 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-37) outlining the surficial aggregate deposits of the map area*

21 I/11, Rogersville

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix I presents descriptions of 13 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-38) outlining the surficial aggregate deposits of the map area*

21 I/12, Blackville

KINGSTON, P.W., and BRINSMEAD, R.A. 1974. Surficial geology and granular resources of Blackville East, 21 I/12 E. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-130.

- *1:50 000 scale surficial geology map of the Despres Lake esker, in the east-central part of the map area*
- *includes marginal notes*

CHANDRA, J., BRINSMEAD, R., and BANCROFT, D. 1975. Seismic surveys carried out in northern, eastern and southern New Brunswick in 1974 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-11, 47 p.

- *presents a description of the surficial deposits in the Despres Lake esker area, accompanied by a page size surficial geology map (~1:58 000 scale)*

SEAMAN, A.A. 1983. Granular aggregate resources, Blackville map-area (N.T.S. 21 I/12), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-12, 73 p.

- *includes a chapter on surficial geology*
- *appendix presents descriptions of 22 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 83-31) outlining the surficial aggregate deposits of the map area*

21 I/13, Newcastle

SHAW, E.W. 1936. Little Southwest Miramichi - Sevogle rivers area, New Brunswick. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 197, 15 p.

- *includes a very brief section on Pleistocene geology*

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Newcastle (21 I/13), Doaktown (21 J/9) and McKendrick Lake (21 J/16), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-5, 127 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 46 surficial deposit sites in the I/13 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-80) outlining the surficial aggregate deposits of the map area*

21 I/14, Kouchibouguac

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix J presents descriptions of 14 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-39) outlining the surficial aggregate deposits of the map area*

21 I/15, Pointe-Sapin

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix K presents descriptions of 2 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-40) outlining the surficial aggregate deposits of the map area*

21 J, WOODSTOCK
1:250 000 scale map area (regional)

CHALMERS, R. 1884. Report on the surface geology of western New Brunswick with special reference to the area included in York and Carleton counties. Geological and Natural History Survey of Canada, Report of Progress, 1882-1884, Part GG, 47 p.

- *includes a brief table of observed striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1888. Report on the surface geology of north-eastern New Brunswick, to accompany quarter-sheet maps 2 N.E. and 6 S.W. Geological and Natural History Survey of Canada, Annual Report, **III** (1887-88): Part N, 33 p.

- *includes descriptions of various types of glacial deposits*
- *Map 2 N.E. (1:253 440 scale) includes the extreme northeast corner of the 21 J map area*

CHALMERS, R. 1890. Report on the surface geology of southern New Brunswick, to accompany ¼ sheet maps 1 S.W., 1 S.E. and 1 N.E. Geological and Natural History Survey of Canada, Annual Report, **IV** (1888-1889): Part N, 92 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 N.E. (1:253 440 scale) includes the extreme southeast corner of the 21 J map area*

CHALMERS, R. 1895. Report on the surface geology of eastern New Brunswick, north-western Nova Scotia and a portion of Prince Edward Island, to accompany ¼ sheet maps, No. 2 S.E., No. 5 S.W. and No. 4 N.W. Geological Survey of Canada, Annual Report, **VII** (1894): Part M, 149 p.

- *includes a comprehensive list of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 2 S.E. (1:253 440 scale) includes the eastern 15% of the 21 J map area, exclusive of the corners*

CHALMERS, R. 1901. Surface geology. *In* Summary Report on the Operations of the Geological Survey for the Year 1900. *Edited by* G.M. Dawson. Geological Survey of Canada, Annual Report, **XIII** (1900): pp.151-161.

- *preliminary report on work on the surface geology of north-western New Brunswick, chiefly in the area of the Grand Falls sheet (i.e. most of the southern 60% of the 21 O map area and the northern 10% of the 21 J map area)*

CHALMERS, R. 1902. Report on the surface geology shown on the Fredericton and Andover quarter-sheet maps, New Brunswick. Geological Survey of Canada, Annual Report, **XII** (1899): Part M, 41 p.

- *includes a comprehensive table of observed striae sites, and descriptions of various types of glacial deposits*
- *Map 1 N.W. (Fredericton; 1:253 440 scale) includes the southern 20% of the New Brunswick part of the 21 J map area, exclusive of the southeast corner*
- *Map 2 S.W. (Andover; 1:253 440 scale) includes the bulk of the New Brunswick part of the 21 J map area, exclusive of the northern 10%, eastern 15% and southern 20%*

RAMPTON, V.N., and PARADIS, S. 1981. Quaternary geology of Woodstock map area (21 J), New Brunswick. New Brunswick Department of Natural Resources, Mineral Development Branch, Map Report 81-1, 37 p.

- *accompanied by a 1:250 000 scale Quaternary geology map (Map 81-001)*

THIBAULT, J., SEAMAN, A.A., and MOTT, R. 1985. Geomorphic features associated with deglaciation and marine submergence in southwest New Brunswick. Geological Association of Canada / Mineralogical Association of Canada, University of New Brunswick, Fredericton, New Brunswick, Excursion 7, 19 p.

- *includes a brief chapter on Quaternary geology*

KETTLES, I.M., and WYATT, P.H. 1985. Applications of till geochemistry in southwestern New Brunswick: acid rain sensitivity and mineral exploration. *In* Current Research, Part B. Geological Survey of Canada, Paper 85-1B, pp. 413-422.

- *covers the southwestern part of the 21 J map area*
- *discusses carbonate and trace element distribution patterns in the area*
- *presents very small scale contoured maps of the study area for clay, silt and sand percentages, and for 14 trace elements*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for sites in the southwestern part of the 21 J map area*
- *sample spacing is irregular, based on road access*
- *accompanied by a 1:500 000 scale site location map*

LAMOTHE, M. 1986. Reconnaissance geochemical sampling of till, south-central Miramichi Zone, New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 86-1B, pp. 279-287.

- *preliminary report on till geochemistry investigations in the Miramichi Highlands terrain lying within the 21 J map area*
- *includes page size maps of Zn, Sn and As abundances in the clay-sized fraction of till samples*

RAPPOL, M. 1986. Aspects of ice flow patterns, glacial sediments, and stratigraphy in northwest New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 86-1B, pp. 223-237.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

RAPPOL, M. 1986. Ice movements in Madawaska and Victoria counties, northwestern New Brunswick. *In* Contributions to the Quaternary Geology of Northern Maine and Adjacent Canada. *Edited by* J.S. Kite, T.V. Lowell, and W.B. Thompson. Maine Geological Survey, Bulletin 37, pp. 103-111.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

LAMOTHE, M. 1988. Till geochemistry over the central part of the Miramichi Zone and vicinity, New Brunswick: a progress report. Geological Survey of Canada, Open File 1967.

- *preliminary report, superseded by GSC Open File 2237*

RAPPOL, M. 1989. Glacial history and stratigraphy of northwestern New Brunswick. Géographie physique et Quaternaire, **43**: 191-206.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the New Brunswick part of the 21 N map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *covers the eastern three-quarters of the northern half of the 21 J map area*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *covers the Miramichi Highlands area of the southern half of the 21 J map area*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

SEAMAN, A.A., BROSTER, B.E., CWYNAR, L.C., LAMOTHE, M., MILLER, R.F., and THIBAULT, J.J. 1993. Field guide to the Quaternary geology of southwestern New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 93-1, 102 p.

- *includes a chapter on Quaternary geology, including a discussion of multiple glacial erosion events*
- *includes information on the south-central part of the 21 J map area*

21 J/1, Minto

DYER, W.S. 1926. Minto coal basin, New Brunswick. Canada Department of Mines, Geological Survey, Memoir 151, 42 p.

- *includes a brief section on glacial geology*

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix L presents descriptions of 3 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-41) outlining the surficial aggregate deposits of the map area*

21 J/2, Burtts Corner

KINGSTON, P.W., and LOHSE, H. 1974. Surficial geology of the Fredericton area. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-132.

- *1:50 000 scale map of approximately the northern half of the G/15 map area and the southern third of the J/2 map area*

SEAMAN, A.A. 1981. Granular aggregate resources, Burtts Corner (NTS 21 J/2), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 81-28, 131 p.

- *includes a chapter on surficial geology*
- *Appendix B presents descriptions of 51 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 81-69) outlining the surficial aggregate deposits of the map area*

SEAMAN, A.A. 1982. The late Quaternary history of the Burtts Corner area, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-2, 105 p.

- *accompanied by a 1:50 000 scale surficial geology map (Plate 82-194)*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 2 till sites and 2 glaciofluvial sites in the J/2 map area*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for two boreholes (3033 and 3034), in the Keswick and Nashwaak river valleys, respectively, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction for both boreholes, and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction for borehole 3033*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 5 identifies the 52 till sample site locations in the J/2 map area*
- *sampling was only carried out in the western half of the map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 10.25 km^2 (western half of the area only)*

HORNIBROOK, E.R.C. 1992. Heavy mineral assemblages and dispersion in Late Wisconsinan till from the Millville-Burtts Corner area, central New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 92-7, 71 p.

- *a report of heavy mineral analyses of Lamothe's samples from the southwestern part of the J/2 map area and the southeastern part of the J/3 map area*

HORNIBROOK, E.R.C., BROSTER, B.E., GARDINER, W.W., and PRONK, A.G. 1993. Glacial dispersal of garnets and other heavy minerals in till: Miramichi area, New Brunswick. Exploration and Mining Geology, **2**: 345-353.

- *a report on heavy mineral dispersal patterns in the southwestern part of the J/2 map area and the southeastern part of the J/3 map area*

21 J/3, Millville

ANDERSON, F.D. 1968. Woodstock, Millville, and Coldstream map-areas, Carleton and York counties, New Brunswick. Geological Survey of Canada, Memoir 353, 69 p.

- *includes a brief section on glaciation*

FINAMORE, P.F. 1981. Granular aggregate resources of the Woodstock and Millville map-areas, New Brunswick (N.T.S. 21 J/4 and 21 J/3). New Brunswick Department of Natural Resources, Mineral Development Branch, Open File Report No. 81-4, 145 p.

- *includes a chapter on surficial geology*
- *Appendix A presents descriptions of 40 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 81-36) outlining the surficial aggregate deposits of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 31 till sites and 4 glaciofluvial sites (plus one site of unknown deposit type) in the J/3 map area [N.B. - sites 1405 and 1417, identified as from the J/3 map area, are from the J/5 map area]*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for two boreholes (3030 and 3031) between Nackawic and Temperance Vale, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 6 identifies the 171 till sample site locations in the J/3 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6.25 km²*

HORNIBROOK, E.R.C. 1992. Heavy mineral assemblages and dispersion in Late Wisconsinan till from the Millville-Burtts Corner area, central New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 92-7, 71 p.

- *a report on heavy mineral analyses of Lamothe's samples from the southwestern part of the J/2 map area and the southeastern part of the J/3 map area*

HORNIBROOK, E.R.C., BROSTER, B.E., GARDINER, W.W., and PRONK, A.G. 1993. Glacial dispersal of garnets and other heavy minerals in till: Miramichi area, New Brunswick. Exploration and Mining Geology, **2**: 345-353.

- *a report on heavy mineral dispersal patterns in the southwestern part of the J/2 map area and the southeastern part of the J/3 map area*

SEAMAN, A.A. 1997. Till geochemistry of the east half of the Millville (NTS 21 J/3) map area, York County, New Brunswick. *In* Current Research 1996. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 97-4, pp. 225-246.

- *includes 4 page size figures identifying sites with anomalous levels of Au, As, Be, Cu, Mo, Pb, Sb, Sn, Th, U, W and Zn*

SEAMAN, A.A., and PREBBLE, A.C. 1997. Au, Ag, As, Hg and Sb values in tills of the east half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-19A.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A., and PREBBLE, A.C. 1997. Cu, Pb, Zn, Co and Ni values in tills of the east half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-19B.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A., and PREBBLE, A.C. 1997. Mn, Fe, Sn, W, Th and U values in tills of the east half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 97-19C.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1998. Till geochemistry of the west half of the Millville (NTS 21 J/3) map area, York and Carleton counties, New Brunswick. *In* Current Research 1997. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 98-4, pp. 75-92.

- *includes 4 page size figures identifying sites with anomalous levels of Au, As, Be, Co, Cu, Hg, Mo, Ni, Pb, Sb, Sn, Th, U, W and Zn*

SEAMAN, A.A. 1998. Au, Ag, As, Hg and Sb values in tills of the west half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 98-19A.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1998. Cu, Pb, Zn, Co and Ni values in tills of the west half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 98-19B.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1998. Mn, Fe, Sn, W, Th and U values in tills of the west half of the Millville (NTS 21 J/03) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 98-19C.

- *sampled on a 2 km grid (1 sample / 4 km²)*

SEAMAN, A.A. 1999. Follow-up till geochemistry in the Millville (NTS 21 J/3) map area, York County, New Brunswick. *In* Current Research 1998. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 99-4, pp. 45-55.

- *describes the results of follow-up till sampling for 34 sites proximal to 10 anomalous sites identified by the original sampling program*

SEAMAN, A.A. 1999. Till geochemistry of the Millville (NTS 21 G/12) map area, York and Carleton counties, New Brunswick: site and geochemical data. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-11, 85 p.

- *Appendix 1 presents site location and characterization, grain size and pebble lithology data for the 336 sites sampled in the above noted DNRE till geochemistry maps and reports*
- *Appendix 2 presents geochemical data, for 46 elements (47 elements for the follow-up sample sites), for the samples collected from these sites*
- *data is in both digital and hard copy format*

21 J/4, Woodstock

CALEY, J.F. 1936. Geology of Woodstock area, Carleton and York counties, New Brunswick. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 198, 21 p.

- *includes a very brief section on glacial geology*

LEE, H.A. 1962. Surficial geology of Canterbury, Woodstock, Florenceville and Andover map-areas; York, Carleton and Victoria counties, New Brunswick (Parts of 21 G/14, 21 J/4, 21 J/5, and 21 J/12). Geological Survey of Canada, Paper 62-12, 8 p.

- *accompanied by a 1:63 360 scale map (Map 24-1962) outlining the surficial geology of the New Brunswick part of the J/4 map area*

ANDERSON, F.D. 1968. Woodstock, Millville, and Coldstream map-areas, Carleton and York counties, New Brunswick. Geological Survey of Canada, Memoir 353, 69 p.

- *includes a brief section on glaciation*

FINAMORE, P.F. 1981. Granular aggregate resources of the Woodstock and Millville map-areas, New Brunswick (N.T.S. 21 J/4 and 21 J/3). New Brunswick Department of Natural Resources, Mineral Development Branch, Open File Report No. 81-4, 145 p.

- *includes a chapter on surficial geology*
- *Appendix B presents descriptions of 44 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 81-38) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 24 till sites and 1 glaciofluvial site in the J/4 map area*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for five boreholes (3024 - 3028) along the Saint John River valley, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction for four of the boreholes (geochemical data for borehole 3027 is absent)*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 7 identifies the 97 till sample site locations in the J/4 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6 km^2*

SEAMAN, A.A. 2000. Till geochemistry of the New Brunswick part of the Woodstock (NTS 21 J/04) map area, Carleton County: site and geochemical data. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 2000-3, 45 p.

- *Appendix 1 presents site location and characterization, grain size and pebble lithology data for 114 sites sampled in the map area; sampling was based on the standard 2 km grid, but only every second grid point was sampled for the area lying to the west of the Woodstock Fault*
- *Appendix 2 presents geochemical data, for 49 elements, for the samples collected from these sites*
- *data is in both digital and hard copy format*
- *the report is accompanied by a 1:50 000 scale site location map (Plate 2000-19)*

SEAMAN, A.A. 2000. Till geochemistry and glacial dispersal in the eastern part of the Woodstock (NTS 21 J/04) map area, Carleton County, New Brunswick. *In* Current Research 1999. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 2000-4, pp. 51-71.

21 J/5, Florenceville

LEE, H.A. 1962. Surficial geology of Canterbury, Woodstock, Florenceville and Andover map-areas; York, Carleton and Victoria counties, New Brunswick (Parts of 21 G/14, 21 J/4, 21 J/5, and 21 J/12). Geological Survey of Canada, Paper 62-12, 8 p.

- *accompanied by a 1:63 360 scale map (Map 25-1962) outlining the surficial geology of the New Brunswick part of the J/5 map area, exclusive of an unmapped area of ~19 km² in the northeastern part of the area*

THIBAULT, J. 1979. Surficial geology of the Village of Florenceville. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 79-147.

- *1:4800 scale map of the municipal area*

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1980. Granular aggregate resources, Andover (N.T.S. 21 J/12) and Florenceville (N.T.S. 21 J/5). New Brunswick Department of Natural Resources, Mineral Development Branch, Open File Report No. 81-2, 111 p.

- *includes a brief section on surficial geology*
- *appendix presents descriptions of 40 surficial deposit sites in the J/5 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-41) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 11 till sites and 6 glaciofluvial sites in the J/5 map area [N.B. - sites 1405 and 1417, identified as from the J/3 map area, are from the J/5 map area]*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the log for a borehole (3023) near Williamstown Lake, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 2 identifies the 18 till sample site locations in the J/5 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 35.5 km²*

21 J/6, Coldstream

ANDERSON, F.D. 1968. Woodstock, Millville, and Coldstream map-areas, Carleton and York counties, New Brunswick. Geological Survey of Canada, Memoir 353, 69 p.

- *includes a brief section on glaciation*

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Coldstream (21 J/6), Napadogan (21 J/7), Hayesville (21 J/10) and Juniper (21 J/11), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-2, 209 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 62 surficial deposit sites in the J/6 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-76) outlining the surficial aggregate deposits of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 12 till sites and 6 glaciofluvial sites in the J/6 map area*
- *sample spacing is irregular, based on road access*

SNOW, R.J., and COKER, W.B. 1987. Overburden geochemistry related to W-Cu-Mo mineralization at Sisson Brook, New Brunswick, Canada: an example of short- and long-distance glacial dispersal. Journal of Geochemical Exploration, 28: 353-368.

- *discussion of a detailed overburden geochemistry program in the east-central part of the J/6 map area and the southwestern part of the J/7 map area*
- *primarily deals with Cu, Mo and W, but also includes data on As, F and Sn*
- *includes a brief description of the Quaternary geology of the study area*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 3 identifies the 178 till sample site locations in the J/6 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6 km^2*
- *there are large gaps in the sample pattern in the south-central part of the map area*

21 J/7, Napadogan

SEAMAN, A.A. 1981. Granular aggregate resources, Burtts Corner (NTS 21 J/2), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 81-28, 131 p.

- *Appendix B includes the description of 1 surficial deposit site from the J/7 map area*

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Coldstream (21 J/6), Napadogan (21 J/7), Hayesville (21 J/10) and Juniper (21 J/11), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-2, 209 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 27 surficial deposit sites in the J/7 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-77) outlining the surficial aggregate deposits of the map area*

SNOW, R.J., and COKER, W.B. 1987. Overburden geochemistry related to W-Cu-Mo mineralization at Sisson Brook, New Brunswick, Canada: an example of short- and long-distance glacial dispersal. Journal of Geochemical Exploration, 28: 353-368.

- *discussion of a detailed overburden geochemistry program in the east-central part of the J/6 map area and the southwestern part of the J/7 map area*
- *primarily deals with Cu, Mo and W, but also includes data on As, F and Sn*
- *includes a brief description of the Quaternary geology of the study area*

LAMOTHE, M. 1990. Till geochemistry over the southern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2238, 62 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 4 identifies the 95 till sample site locations in the J/7 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 11.25 km²*

21 J/8, Boiestown

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix M presents descriptions of 6 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-42) outlining the surficial aggregate deposits of the map area*

21 J/9, Doaktown

POOLE, W.H. 1960. Hayesville and McNamee map-areas, York, Northumberland, and Carleton counties, New Brunswick, 21J/10 and 21J/9(W½). Geological Survey of Canada, Paper 60-15, 10 p.

- *includes a very brief section on glaciation*

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Newcastle (21 I/13), Doaktown (21 J/9) and McKendrick Lake (21 J/16), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-3, 127 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 35 surficial deposit sites in the J/9 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-79) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 11 identifies the 36 till sample site locations in the J/9 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 14 km² (west half of the map area only)*
- *most of the samples are from the northwest corner of the map area*

21 J/10, Hayesville

POOLE, W.H. 1960. Hayesville and McNamee map-areas, York, Northumberland, and Carleton counties, New Brunswick, 21J/10 and 21J/9(W½). Geological Survey of Canada, Paper 60-15, 10 p.

- *includes a very brief section on glaciation*

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Coldstream (21 J/6), Napadogan (21 J/7), Hayesville (21 J/10) and Juniper (21 J/11), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-2, 209 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 40 surficial deposit sites in the J/10 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-75) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry in the vicinity of the Late Devonian granites of the Hayesville area, central New Brunswick: a trenching project. Geological Survey of Canada, Open File 2217, 66 p.

- *presents the results of a trenching project around the Burnt Hill and Dungarvon granites*
- *presents geochemical data for 16 elements analysed on the clay fraction, and for As, Au and Sb (plus 6 other elements for some samples) analysed on the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 10 identifies the 319 till sample site locations in the J/10 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 3.25 km²*
- *sampling was concentrated in eastern and south-central parts of the map area; large gaps are present in the sample pattern in the western part of the map area*

HORNIBROOK, E.R.C. 1991. Glacial dispersal of heavy minerals in the Todd Mountain area, central New Brunswick. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Open File Report 91-11, 145 p.

- *presents heavy mineral analyses of Lamothe's samples from the map area*

HORNIBROOK, E.R.C., BROSTER, B.E., GARDINER, W.W., and PRONK, A.G. 1991. Glacial dispersal of heavy minerals in late Wisconsinan till, central New Brunswick. Atlantic Geology, **27**: 199-208.

- *a report on heavy mineral dispersal patterns in the southeastern and south-central parts of the map area*

PARKHILL, M.A. 1994. Surficial geology and till geochemistry in northern New Brunswick: summary of projects and current database. *In* Current Research 1993. *Compiled and edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 12, pp. 129-146.

- *contains a summary of till geochemistry projects carried out in northern New Brunswick, including the J/10 map area*
- *includes a table showing the average elemental values for 22 elements for basal till overlying different rock units*

21 J/11, Juniper

HUNTER, M., and LAVERGNE, C. (GEOCON INC.). 1982. Granular aggregate resources of Coldstream (21 J/6), Napadogan (21 J/7), Hayesville (21 J/10) and Juniper (21 J/11), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-2, 209 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 46 surficial deposit sites in the J/11 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-74) outlining the surficial aggregate deposits of the map area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 9 till sites and 1 glaciofluvial site in the J/11 map area*
- *sample spacing is irregular, based on road access*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 9 identifies the 130 till sample site locations in the J/11 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 8 km^2*
- *large gaps are present in the sample pattern, particularly in the western half of the map area*

21 J/12, Perth-Andover (formerly Andover)

LEE, H.A. 1962. Surficial geology of Canterbury, Woodstock, Florenceville and Andover map-areas; York, Carleton and Victoria counties, New Brunswick (Parts of 21 G/14, 21 J/4, 21 J/5, and 21 J/12). Geological Survey of Canada, Paper 62-12, 8 p.

- *accompanied by a 1:63 360 scale map (Map 26-1962) outlining the surficial geology of the New Brunswick part of the J/12 map area, exclusive of an unmapped area of ~71 km² in the northeastern corner*

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1980. Granular aggregate resources, Andover (N.T.S. 21 J/12) and Florenceville (N.T.S. 21 J/5). New Brunswick Department of Natural Resources, Mineral Development Branch, Open File Report No. 81-2, 111 p.

- *includes a brief section on surficial geology*
- *appendix presents descriptions of 45 surficial deposit sites in the J/12 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-40) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

THIBAULT, J. 1985. Surficial geology of Perth-Andover. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-11.

- *1:10 000 scale map of the municipal area*

KETTLES, I.M., and WYATT, P.H. 1986. Reconnaissance geochemical data for till and other surficial sediments, southwestern New Brunswick. Geological Survey of Canada, Open File 1313, 21 p.

- *presents geochemical (Ag, As, Cd, Co, Cr, Cu, Fe, Hg, Mn, Mo, Ni, Pb, U, and Zn) and grain size data for 16 till sites and 5 glaciofluvial sites in the J/12 map area*
- *sample spacing is irregular, based on road access*

RAPPOL, M. 1988. Glacial dispersal of Deboullie syenite, northern Maine, into western New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 88-1B, pp. 49-53.

- *presents data on glacial striae and till fabric trends, and distribution of Deboullie syenite erratics, in the J/13, J/14 and O/4 map areas*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for two boreholes (3021 and 3022) along the Saint John River near Kilburn, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

21 J/13, Aroostook

LEE, H.A. 1959. Surficial geology, Aroostook, Victoria County, New Brunswick. Geological Survey of Canada, Map 34-1959.

- *1:63 360 scale map of the New Brunswick part of the map area, exclusive of an unmapped area of ~102 km² in the southeastern corner*
- *includes marginal notes*

THIBAULT, J. 1980. Granular aggregate resources, Saint-André (NTS 21 O/4), Aroostook (NTS 21 J/13), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 80-6, 128 p.

- *includes a chapter on surficial geology*
- *Appendix C presents descriptions of 31 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 80-81) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for three boreholes (3012, 3014 and 3020) from the Saint John River valley, Anfield and the Little Salmon River valley, respectively, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

WILSON, R.A. 1990. Geology of New Denmark - Salmon River area, Victoria County, New Brunswick (parts of NTS 21J/13, 21J/14, 21O/3, 21O/4). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Report of Investigation 23, 67 p.

- *includes a brief section on glacial geology*

21 J/14, Plaster Rock

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Riley Brook (21 O/3), Plaster Rock (21 J/14) and Tuadook Lake (21 J/15), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-1, 93 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 37 surficial deposit sites in the J/14 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-72) outlining the surficial aggregate deposits of the map area*

SKINNER, R. 1982. Geology of the Plaster Rock (east half) map area, New Brunswick. Geological Survey of Canada, Paper 81-8, 16 p.

- *includes a very brief section on glaciation*

FYFFE, L.R., and PRONK, A.G. 1985. Bedrock and surficial geology - rock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Report of Investigation No. 20, 74 p.

- *study area includes ~28 km² in the northeast corner of the J/14 map area*
- *accompanied by 1:50 000 scale maps of Surficial Geology (Plate 84-23A), Till Geochemistry (Ag, Co, Cu, Fe, Mn, Mo, Ni, Pb, U, W and Zn, for panned concentrates of C-horizon till; Plate 84-24A), Till Geochemistry Anomalies (Plate 84-25A), Till Pebble Lithology (Plate 84-26A) and Till Mineralogy (Plate 84-27A)*
- *till samples were collected on a 1 km grid from 15 sites in the J/14 map area*

RAPPOL, M. 1988. Glacial dispersal of Deboullie syenite, northern Maine, into western New Brunswick. *In* Current Research, PartB. Geological Survey of Canada, Paper 88-1B, pp. 49-53.

- *presents data on glacial striae and till fabric trends, and distribution of Deboullie syenite erratics, in the J/13, J/14 and O/4 map areas*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 8 identifies the 119 till sample site locations in the J/14 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6 km² for the eastern half of the map area, and ~ 1 sample / 18 km² for the western half*

WILSON, R.A. 1990. Geology of New Denmark - Salmon River area, Victoria County, New Brunswick (parts of NTS 21 J/13, 21 J/14, 21 O/3, 21 O/4). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Report of Investigation 23, 67 p.

- *includes a brief section on glacial geology*

21 J/15, Tuadook Lake

SKINNER, R. 1975. Geology of the Tuadook Lake map area, New Brunswick (21 J/15). Geological Survey of Canada, Paper 74-33, 9 p.

- *includes a very brief section on glaciation*

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Riley Brook (21 O/3), Plaster Rock (21 J/14) and Tuadook Lake (21 J/15), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-1, 93 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 15 surficial deposit sites in the J/15 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-73) outlining the surficial aggregate deposits of the map area*

FYFFE, L.R., and PRONK, A.G. 1985. Bedrock and surficial geology - rock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Report of Investigation No. 20, 74 p.

- *study area includes ~83 km² in the northwest corner of the J/15 map area*
- *accompanied by 1:50 000 scale maps of Surficial Geology (Plate 84-23A), Till Geochemistry (Ag, Co, Cu, Fe, Mn, Mo, Ni, Pb, U, W and Zn, for panned concentrates of C-horizon till; Plate 84-24A), Till Geochemistry Anomalies (Plate 84-25A), Till Pebble Lithology (Plate 84-26A) and Till Mineralogy (Plate 84-27A)*
- *till samples were collected on a 1 km grid from 60 sites in the J/15 map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 7 identifies the 214 till sample site locations in the J/15 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 5 km²*

21 J/16, McKendrick Lake

SHAW, E.W. 1936. Little Southwest Miramichi - Sevogle rivers area, New Brunswick. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 197, 15 p.

- *includes a very brief section on Pleistocene geology*

ANDERSON, F.D. 1970. Geology of McKendrick Lake map-area, New Brunswick. Geological Survey of Canada, Paper 69-12, 16 p.

- *includes a very brief section on glaciation*

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Newcastle (21 I/13), Doaktown (21 J/9) and McKendrick Lake (21 J/16), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-3, 127p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 27 surficial deposit sites in the J/16 map area*
- *accompanied by a 1:50000 scale map (Plate 81-78) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 6 identifies the 190 till sample site locations in the J/16 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 5.5 km²*
- *there is a large gap in the sample pattern in the southeastern corner of the map area*

21 N, EDMUNDSTON
1:250 000 scale map area (regional)

JONES, R.A. 1961. Wild Goose - Baker Lake area, Restigouche and Madawaska counties. New Brunswick Department of Lands and Mines, Mines Branch, Geological Notes P.M. 58-1, 14 p.
- *includes a very brief section on Pleistocene geology*

GAUTHIER, C. 1980. Existence of a central New Brunswick ice cap based on evidence of northwestward-moving ice in the Edmundston area, New Brunswick. *In* Current Research, Part A. Geological Survey of Canada, Paper 80-1A, pp. 377-378.

GAUTHIER, C., and THIBAULT, J. 1980. Deglaciation of the Edmundston area and reappraisal of Glacial Lake Madawaska interpretation. *In* A Guidebook to the Geology of Northeastern Maine and Neighboring New Brunswick. *Edited by* D.C. Roy and R.S. Naylor. The 72nd Annual Meeting of the New England Intercollegiate Geological Conference, Boston College Press, pp. 188-190.

KITE, J.S., and BORNS, H.W., Jr. 1980. Late-glacial and Holocene geology of the middle St. John River valley. *In* A Guidebook to the Geology of Northeastern Maine and Neighboring New Brunswick. *Edited by* D.C. Roy and R.S. Naylor. The 72nd Annual Meeting of the New England Intercollegiate Geological Conference, Boston College Press, pp. 213-231.

GAUTHIER, R.C. 1982. Surficial deposits, northern New Brunswick. Geological Survey of Canada, Open File 856.
- *1:100 000 scale maps 21 N/S and 21 N/N cover the New Brunswick part of the 21 N map area*

GAUTHIER, R.C. 1983. Surficial materials of northern New Brunswick. Geological Survey of Canada, Open File 963.

RAMPTON, V.N. 1986. Quaternary geology of Madawaska County, western New Brunswick: a brief overview. *In* Contributions to the Quaternary Geology of Northern Maine and Adjacent Canada. *Edited by* J.S. Kite, T.V. Lowell and W.B. Thompson. Maine Geological Survey, Bulletin 37, pp. 95-102.
- *covers the Madawaska County part of the 21 N map area*

RAPPOL, M. 1986. Aspects of ice flow patterns, glacial sediments, and stratigraphy in northwest New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 86-1B, pp. 223-237.
- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

RAPPOL, M. 1986. Ice movements in Madawaska and Victoria counties, northwestern New Brunswick. *In* Contributions to the Quaternary Geology of Northern Maine and Adjacent Canada. *Edited by* J.S. Kite, T.V. Lowell and W.B. Thompson. Maine Geological Survey, Bulletin 37, pp. 103-111.
- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

RAPPOL, M. 1989. Glacial history and stratigraphy of northwestern New Brunswick. Géographie physique et Quaternaire, **43**: 191-206.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the New Brunswick part of the 21 N map area*

RAPPOL, M., and RUSSEL, H. 1989. Glacial dispersal of Precambrian Shield and local Appalachian rocks in the lower St. Lawrence region and western Gaspésie, Quebec, and in adjacent New Brunswick. *In* Current Research, PartB. Geological Survey of Canada, Paper 89-1B, pp. 127-136.

- *documents glacial dispersal into the 21 N map area and the western half of the 21 O map area*

21 N/2, Connors; N/3, Little Black River; N/6, Estcourt; N/7, Lac Baker

DAVIES, J.L., and SEAMAN, A.A. 1983. Bedrock and surficial geology, Village of St. Francois de Madawaska, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 83-8, 4 p.

- *includes a brief description of the surficial geology of the municipal area*
- *accompanied by a 1:15 840 scale surficial geology map*

THIBAULT, J. 1987. Granular aggregate resources of the Madawaska Panhandle, northwestern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-3, 80 p.

- *includes a brief chapter on surficial geology*
- *appendix presents detailed descriptions of 14 surficial deposit sites and brief descriptions of 27 others*
- *accompanied by a 1:50 000 scale map (Plate 86-228) outlining the surficial aggregate deposits of the New Brunswick parts of the map areas*

21 N/8, Edmundston

LEE, H.A. 1955. Surficial geology of Edmundston, Madawaska and Temiscouata counties, New Brunswick and Quebec. Geological Survey of Canada, Paper 55-15, 14 p.

- *accompanied by a 1:63 360 scale map (Preliminary Map 55-15) outlining the surficial geology of the New Brunswick part of the N/8 map area*
- *includes the extreme northeast corner of map area N/1, normally combined with map area O/4*

THIBAULT, J. 1979. Granular aggregate resources of the Grandmaison (N.T.S. 21 N/9) and the Edmundston (N.T.S. 21 N/8) map areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-31, 115 p.

- *includes a section on surficial geology*
- *Appendix A presents descriptions of 62 surficial deposit sites in the N/8 map area*
- *accompanied by a 1:50 000 scale map (Plate 79-35) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the log for a borehole (3050) from the Rivière Verte valley, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction*

21 N/9, Grandmaison

THIBAULT, J. 1979. Granular aggregate resources of the Grandmaison (N.T.S. 21 N/9) and the Edmundston (N.T.S. 21 N/8) map areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-31, 115 p.

- *includes a section on surficial geology*
- *Appendix A presents descriptions of 27 surficial deposit sites in the N/9 map area*
- *accompanied by a 1:50 000 scale map (Plate 79-36) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 N/16, Wild Goose Lake

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 8 surficial deposit sites in the N/9 map area*
- *Appendix B presents brief descriptions of an additional 5 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-1) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 O, CAMPBELLTON
1:250 000 scale map area (regional)

CHALMERS, R. 1881. On the glacial phenomena of the Bay Chaleur region. The Canadian Naturalist, x: No. 1, pp. 37-54.

- *includes a listing of glacial striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1882. On the surface geology of the Baie des Chaleur region. The Canadian Naturalist, x: No. 4, pp. 193-212.

- *includes a listing of more glacial striae sites, and further descriptions of various types of glacial deposits*

CHALMERS, R. 1887. Report to accompany quarter-sheet maps 3 S.E. and 3 S.W.: surface geology, northern New Brunswick and southeastern Quebec. Geological and Natural History Survey of Canada, Annual Report, **II** (1886): Part M, 39 p.

- *includes a brief table of glacial striae sites, and descriptions of various types of glacial deposits*
- *Map 3 S.E. (1:253 440 scale) includes the eastern 15% of the northern 40% of the 21 O map area*
- *Map 3 S.W. (1:253 440 scale) includes the northern 40% of the 21 O map area, exclusive of the eastern and western edges*

CHALMERS, R. 1887. On the glaciation and Pleistocene subsidence of northern New Brunswick and southeastern Quebec. Royal Society of Canada, Transactions, **IV**: series III, Section 4, pp. 139-145.

CHALMERS, R. 1888. Report on the surface geology of northeastern New Brunswick, to accompany quarter-sheet maps 2 N.E. and 6 S.W. Geological and Natural History Survey of Canada, Annual Report, **III** (1887-88): Part N, 33 p.

- *includes descriptions of various types of glacial deposits*
- *Map 2 N.E. (1:253 440 scale) includes the eastern 15% of the southern 60% of the 21 O map area*

CHALMERS, R. 1901. Surface geology. *In* Summary Report on the Operations of the Geological Survey for the Year 1900. *Edited by* G.M. Dawson. Geological Survey of Canada, Annual Report, **XIII** (1900): pp. 151-161.

- *preliminary report on work on the surface geology of northwestern New Brunswick, chiefly in the area of the Grand Falls sheet (i.e., most of the southern 60% of the 21 O map area and the northern 10% of the 21 J map area)*

ALCOCK, F.J. 1935. Geology of Chaleur Bay region. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 183, 146 p.

- *includes sections on Quaternary geology and on the effects of glaciation*

PRESANT, E.W. 1966. A trace element study of podzol soils, Bathurst district, New Brunswick. *In* Symposium on Geochemical Prospecting. *Edited by* E.M. Cameron. Geological Survey of Canada, Paper 66-54, pp. 222-232.

- *an investigation of the distribution of Cu, Pb, Zn, Fe, Mn, As, Sb, Ag, Sn and Cd in soil profiles from a number of sites in the Bathurst camp*

AIRPHOTO ANALYSIS ASSOCIATES CONSULTANTS LIMITED. 1975. Beach resources, eastern New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 2, 215 p.

- *includes a section on "Surficial Geology"*
- *accompanied by a 1:1 000 000 scale map of the surficial geology of the coastal part of eastern New Brunswick*

GAUTHIER, R.C. 1979. Aspects of the glacial history of the north-central Highlands of New Brunswick. *In* Current Research, PartB. Geological Survey of Canada, Paper 79-1B, pp. 371-377.

- *covers the southeastern part of the 21 O map area, comprising the areas covered by the 1:50 000 scale map areas O/1, O/2, O/7, O/8, O/9 and O/10*

KITE, J.S., and BORNS, H.W., Jr. 1980. Late-glacial and Holocene geology of the middle St. John River valley. *In* A Guidebook to the Geology of Northeastern Maine and Neighboring New Brunswick. *Edited by* D.C. Roy and R.S. Naylor. The 72nd Annual Meeting of the New England Intercollegiate Geological Conference, Boston College Press, pp. 213-231.

GAUTHIER, R.C. 1982. Surficial deposits, northern New Brunswick. Geological Survey of Canada, Open File 856.

- *1:100 000 scale maps 21 O/NE, 21 O/NW, 21 O/SE and 21 O/SW cover the New Brunswick part of the 21 O map area*

GAUTHIER, R.C. 1983. Surficial materials of northern New Brunswick. Geological Survey of Canada, Open File 963.

RAMPTON, V.N. 1986. Quaternary geology of Madawaska County, western New Brunswick: a brief overview. *In* Contributions to the Quaternary Geology of Northern Maine and Adjacent Canada. *Edited by* J.S. Kite, T.V. Lowell and W.B. Thompson. Maine Geological Survey, Bulletin 37, pp. 95-102.

- *covers the southwest corner of the 21 O map area*

RAPPOL, M. 1986. Aspects of ice flow patterns, glacial sediments, and stratigraphy in northwest New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 86-1B, pp. 223-237.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

RAPPOL, M. 1986. Ice movements in Madawaska and Victoria counties, northwestern New Brunswick. *In* Contributions to the Quaternary Geology of Northern Maine and Adjacent Canada. *Edited by* J.S. Kite, T.V. Lowell and W.B. Thompson. Maine Geological Survey, Bulletin 37, pp. 103-111.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the Madawaska County part of the 21 N map area*

LAMOTHE, M. 1988. Till geochemistry over the northern part of the Miramichi Zone and vicinity: a progress report. Geological Survey of Canada, Open File 1909.

- *preliminary report, superseded by GSC Open File 2236*

LAMOTHE, M. 1988. Till geochemistry over the central part of the Miramichi Zone and vicinity, New Brunswick: a progress report. Geological Survey of Canada, Open File 1967.

- *preliminary report, superseded by GSC Open File 2237*

PRONK, A.G., and PARKHILL, M.A. 1988. Quaternary geology and till geochemistry in northern New Brunswick. *In* Thirteenth Annual Review of Activities, Project Résumés, 1988. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 88-2, pp. 76-80.

- *preliminary report*

PRONK, A.G., BOBROWSKY, P.T., and PARKHILL, M.A. 1989. An interpretation of Late Quaternary glacial flow indicators in the Baie des Chaleurs region, northern New Brunswick. Géographie physique et Quaternaire, **43**: 179-190.

RAPPOL, M. 1989. Glacial history and stratigraphy of northwestern New Brunswick. Géographie physique et Quaternaire, **43**: 191-206.

- *covers the northwest corner of the 21 J map area, the southwest corner of the 21 O map area, and the New Brunswick part of the 21 N map area*

RAPPOL, M., and RUSSEL, H. 1989. Glacial dispersal of Precambrian Shield and local Appalachian rocks in the lower St. Lawrence region and western Gaspésie, Quebec, and in adjacent New Brunswick. *In* Current Research, PartB. Geological Survey of Canada, Paper 89-1B, pp. 127-136.

- *documents glacial dispersal into the 21 N map area and the western half of the 21 O map area*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *covers the northern three-quarters of the eastern half of the 21 O map area*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *covers the southern quarter of the of the eastern three-quarters of the 21 O map area*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

LAMOTHE, M. 1992. Pleistocene stratigraphy and till geochemistry of the Miramichi Zone, New Brunswick. Geological Survey of Canada, Bulletin 433, 58 p.

- *accompanied by colour plots of regional abundances of Cu, Hg, Pb, Sb, Sn, U, W and Zn in the clay fraction of tills (mud fraction for Sb)*

PARKHILL, M.A. 1994. Surficial geology and till geochemistry in northern New Brunswick: summary of projects and current database. *In* Current Research 1993. *Compiled and edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 12, pp. 129-146.

- *contains a summary of till geochemistry projects carried out in northern New Brunswick, primarily in the 21 O map area*
- *includes a table showing the average elemental values for 22 elements for basal till overlying different rock units*

21 O/1, Big Bald Mountain

SHAW, E.W. 1936. Little Southwest Miramichi - Sevogle rivers area, New Brunswick. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 197, 15 p.

- *includes a very brief section on Pleistocene geology*

GAUTHIER, C. 1980. Decomposed granite, Big Bald Mountain area, New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 80-1B, pp. 277-282.

- *describes an extensive area of weathered granite, commonly underlying glacial till, and discusses the glacial implications of the preservation of this weathered material*

PARADIS, S., THOMAS, R.D., and RAMPTON, V.N. (TERRAIN ANALYSIS AND MAPPING SERVICES LTD.). 1986. Granular aggregate resources of Big Bald Mountain (NTS 21 O/1), Serpentine Lake (NTS 21 O/2), and California Lake (NTS 21 O/8), New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-5, 132 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 17 surficial deposit sites*
- *Appendix B presents brief descriptions of an additional 56 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-7) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 4 identifies the 250 till sample site locations in the O/1 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 4.2 km²*

DOIRON, A. 1991. Géologie du Quaternaire et géochimie des tills des régions de Big Bald Mountain (SNRC 21 O/1) et de Serpentine Lake (SNRC 21 O/2), comtés de Northumberland et de Victoria, Nouveau-Brunswick. *In* Project Summaries for 1991: Sixteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 91-2, pp. 199-200.

- *preliminary report*

DOIRON, A. 1992. Études préliminaires de la géologie du Quaternaire des régions de Big Bald Mountain et de Serpentine Lake, Nouveau-Brunswick. *In* Current Research, Part D. Geological Survey of Canada, Paper 92-1D, pp. 77-82.

- *preliminary report*

DOIRON, A. 1993. Till geochemistry of the Big Bald Mountain area, New Brunswick. GSC Open File 2560, 169 p.

- *presents geochemical data for 37 elements from the silt + clay fraction (<63 μm) of C-horizon till samples collected from 306 sites [145 newly sampled sites, and 161 of LAMOTHE's (1990) sites for which archived samples were reanalyzed]*
- *sample spacing approximates a 2 km grid (1 sample / 4 km²)*
- *includes 44 page-size proportional dot (range) plots of the map area for the 37 elements plus Ca (Ba, Co, Cr, Ni, Rb and Zr were analyzed by two different methods)*
- *includes a chapter on Quaternary Geology*
- *accompanied by four 1:50000 scale till geochemistry maps (1: Cu, Pb, Zn, Au, Ag, As, W, Sb, Mo; 2: Co, Ni, Cr, U, Ba, Nb, Rb, Sr, Fe; 3: Sc, Sm, Ta, Tb, Th, V, Y, Yb, Zr; 4: Br, Ca, Ce, Cs, Eu, Ga, Hf, Ho, La, Lu, Na, Nd)*

21 O/2, Serpentine Lake

FYFFE, L.R., and PRONK, A.G. 1985. Bedrock and surficial geology - rock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Report of Investigation No. 20, 74 p.

- *study area includes ~195 km² in the southwest corner of the O/2 map area*
- *accompanied by 1:50 000 scale maps of Surficial Geology (Plate 84-23A), Till Geochemistry (Ag, Co, Cu, Fe, Mn, Mo, Ni, Pb, U, W and Zn, for panned concentrates of C-horizon till; Plate 84-24A), Till Geochemistry Anomalies (Plate 84-25A), Till Pebble Lithology (Plate 84-26A) and Till Mineralogy (Plate 84-27A)*
- *till samples were collected on a 1 km grid from 86 sites in the southern part of the study area within the O/2 map area*

PARADIS, S., THOMAS, R.D., and RAMPTON, V.N. (TERRAIN ANALYSIS AND MAPPING SERVICES LTD.). 1986. Granular aggregate resources of Big Bald Mountain (NTS 21 O/1), Serpentine Lake (NTS 21 O/2), and California Lake (NTS 21 O/8), New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-5, 132 p.

- *includes a section on surficial geology*
- *Appendix C presents detailed descriptions of 13 surficial deposit sites*
- *Appendix D presents brief descriptions of an additional 34 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-8) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 3 identifies the 147 till sample site locations in the O/2 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 7 km²*
- *there is a very large gap in the sample pattern in the central and east-central part of the map area*

DOIRON, A. 1991. Géologie du Quaternaire et géochimie des tills des régions de Big Bald Mountain (SNRC 21 O/1) et de Serpentine Lake (SNRC 21 O/2), comtés de Northumberland et de Victoria, Nouveau-Brunswick. *In* Project Summaries for 1991: Sixteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 91-2, pp. 199-200.

- *preliminary report*

DOIRON, A. 1992. Études préliminaires de la géologie du Quaternaire des régions de Big Bald Mountain et de Serpentine Lake, Nouveau-Brunswick. *In* Current Research, Part D. Geological Survey of Canada, Paper 92-1D, pp. 77-82.

- *preliminary report*

DOIRON, A. 1993. Till geochemistry of the Serpentine Lake area, New Brunswick. GSC Open File 2246, 163 p.

- *presents geochemical data for 37 elements from the silt + clay fraction (<63 µm) of C-horizon till samples collected from 307 sites [218 newly sampled sites, and 89 of LAMOTHE's (1990) sites for which archived samples were reanalyzed]*
- *sample spacing approximates a 2 km grid (1 sample / 4 km²)*
- *includes 45 page-size proportional dot (range) plots of the map area for the 37 elements plus Ca and Na (Ba, Co, Cr, Ni, Rb and Zr were analyzed by two different methods)*
- *includes a chapter on Quaternary Geology*
- *accompanied by four 1:50 000 scale till geochemistry maps (1: Cu, Pb, Zn, Au, Ag, As, W, Sb, Mo; 2: Co, Ni, Cr, U, Ba, Nb, Rb, Sr, Fe; 3: Sc, Sm, Ta, Tb, Th, V, Y, Yb, Zr; 4: Br, Ca, Ce, Cs, Eu, Ga, Hf, Ho, La, Lu, Na, Nd)*

21 O/3, Riley Brook

LAVERGNE, C., and HUNTER, M. (GEOCON INC.). 1982. Granular aggregate resources of Riley Brook (21 O/3), Plaster Rock (21 J/14) and Tuadook Lake (21 J/15), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report No. 82-1, 93 p.

- *includes a brief section on glacial geology*
- *Appendix 1 presents descriptions of 18 surficial deposit sites in the O/3 map area*
- *accompanied by a 1:50 000 scale map (Plate 81-71) outlining the surficial aggregate deposits of the map area*

FYFFE, L.R., and PRONK, A.G. 1985. Bedrock and surficial geology -rock and till geochemistry in the Trousers Lake area, Victoria County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Report of Investigation No. 20, 74 p.

- *study area includes ~65 km² in the southeast corner of the O/3 map area*
- *accompanied by 1:50 000 scale maps of Surficial Geology (Plate 84-23A), Till Geochemistry (Ag, Co, Cu, Fe, Mn, Mo, Ni, Pb, U, W and Zn, for panned concentrates of C-horizon till; Plate 84-24A), Till Geochemistry Anomalies (Plate 84-25A), Till Pebble Lithology (Plate 84-26A) and Till Mineralogy (Plate 84-27A)*
- *till samples were collected on a 1 km grid from 12 sites in the southeastern part of the study area within the O/3 map area*

PRONK, A.G., and PARKHILL, M.A. 1989. Surficial geology and till geochemistry (Au, Ag, As, Hg, Sb, Cu, Pb, Zn, Co, Ni, Mo, Mn, Fe and W) of Riley Brook (21 O/3) map area, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geological Notes Series PM 89-71, 11 p.

- *accompanied by a surficial geology map (Plate 89-71A) and three till geochemistry maps (Plates 89-71B, C and D) at 1:50 000 scale*
- *sampled on a 2 km grid (1 sample / 4 km²)*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 106 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 2 identifies the 63 till sample site locations in the O/3 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 8.3 km² (east half of the map area only)*

WILSON, R.A. 1990. Geology of New Denmark - Salmon River area, Victoria County, New Brunswick (parts of NTS 21 J/13, 21 J/14, 21 O/3, 21 O/4). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Report of Investigation 23, 67 p.

- *includes a brief section on glacial geology*

21 O/4, Grand Falls (formerly Saint-André)

LEE, H.A. 1955. Surficial geology of Edmundston, Madawaska and Temiscouata counties, New Brunswick and Quebec. Geological Survey of Canada, Paper 55-15, 14 p.

- *accompanied by a 1:63 360 scale map (Preliminary Map 55-15) outlining the surficial geology of the New Brunswick part of the N/8 map area*
- *includes the extreme northeast corner of map area N/1, normally combined with map area O/4*

LEE, H.A. 1959. Surficial geology, Grand Falls, Madawaska and Victoria counties, New Brunswick. Geological Survey of Canada, Map 24-1959.

- *1:63 360 scale map of the New Brunswick part of the map area, exclusive of an unmapped area of ~373 km² in the eastern, northeastern and north-central parts of the map area*
- *includes marginal notes*

LEE, H.A. 1966. The Grand Falls morainic system. *In* Report of Activities, May to October, 1965. Geological Survey of Canada, Paper 66-1, p. 168.

- *a brief description of the extent of the Grand Falls moraine*

THIBAULT, J. 1980. Granular aggregate resources, Saint-André (NTS 21 O/4), Aroostook (NTS 21 J/13), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 80-6, 128 p.

- *includes a chapter on surficial geology*
- *Appendix B presents descriptions of 45 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 80-80) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

THIBAULT, J. 1985. Géologie de surface - Village de Drummond, Comté de Victoria. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-12.

- *page-size 1:50 000 scale map of the municipal area*

RAPPOL, M. 1988. Glacial dispersal of Deboullie syenite, northern Maine, into western New Brunswick. *In* Current Research, Part B. Geological Survey of Canada, Paper 88-1B, pp. 49-53.

- *presents data on glacial striae and till fabric trends, and distribution of Deboullie syenite erratics, in the J/13, J/14 and O/4 map areas*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for a borehole (3001) from the Grande Rivière valley, for eight boreholes (3002 - 3008 and 3010) from the Saint John River valley, and for three boreholes (3009, 3016 and 3019) from the Salmon River valley, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, Ba, Co, Cr, Fe, Hg, Mo, Ni, Rb, Sb, Th, U, W and Zn in the silt plus clay fraction*

WILSON, R.A. 1990. Geology of New Denmark - Salmon River area, Victoria County, New Brunswick (parts of NTS 21 J/13, 21 J/14, 21 O/3, 21 O/4). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Report of Investigation 23, 67 p.

- *includes a brief section on glacial geology*

21 O/5, Grand River

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 25 surficial deposit sites in the O/5 map area*
- *Appendix B presents brief descriptions of an additional 16 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-2) outlining the surficial aggregate deposits of the map area*

21 O/6, Sisson Branch Reservoir

DAVIES, J.L., and SEAMAN, A.A. 1982. Bedrock and surficial geology, St. Quentin, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 82-32, 5 p.

- *includes a brief description of the surficial geology of the municipal area*

THIBAULT, J. 1985. Granular aggregate resources and surficial geology of Sisson Branch Reservoir (21 O/6). New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 85-3, 46 p.

- *includes a chapter on surficial geology*
- *Appendix B presents detailed descriptions of 13 surficial deposit sites*
- *Appendices B and C present brief descriptions of 17 other sites*
- *Appendix D lists textural data for 34 till samples and geochemical (Ag, Co, Cu, Fe, Mn, Mo, Ni, Pb, W and Zn) data (based on the clay size fraction) for 30 of these samples*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 37 km²*
- *accompanied by a 1:50 000 scale map (Plate 85-1) outlining the surficial aggregate deposits of the map area*
- *accompanied by a 1:50 000 scale map (Plate 84-480) outlining the surficial geology of the map area*

21 O/7, Nepisiguit Lakes

BRINSMEAD, R.A. 1979. Granular aggregate resources, Upsalquitch Forks (21 O/10) and part of Nepisiguit Lakes (21 O/7) map-areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No.79-11, 53 p.

- *includes a chapter on glacial history*
- *appendix presents descriptions of 10 surficial deposit sites in the O/7 map area*
- *accompanied by 1:50 000 scale maps (Plates 79-37 and 79-38) outlining the surficial aggregate deposits of the Restigouche County (northern) part of the map area only*
- *this report is superseded by SEAMAN (1985), below, for the O/7 map area*

SEAMAN, A. 1985. Granular aggregate resources, Nepisiguit Lakes map area (N.T.S. 21 O/7), New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Division, Open File Report 85-5, 66 p.

- *includes a chapter on glacial history*
- *Appendix A presents detailed descriptions of 21 surficial deposit sites*
- *Appendix B present brief descriptions of 28 other sites*
- *accompanied by a 1:50 000 scale map (Plate 84-450) outlining the surficial aggregate deposits of the map area*

SEAMAN, A.A. 1985. Till sample geochemistry, Nepisiguit Lakes, 21 O/7. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-5.

- *presents geochemical (Ag, Au, Co, Cu, Fe, Mn, Mo, Ni, Pb, U, W and Zn) data (based on the clay size fraction) for 36 till samples*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 30 km²*

PARKHILL, M.A. 1989. Surficial geology and till geochemistry of the Nepisiguit Lakes map area (NTS 21 O/7), Northumberland and Restigouche counties, New Brunswick. *In* Project Summaries for 1989: Fourteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Information Circular 89-2, pp. 104-109.

- *preliminary report*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 6 identifies the 63 till sample site locations in the O/7 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 16.5 km²*

PARKHILL, M.A. 1993. Surficial geology and till geochemistry of the Nepisiguit Lakes (NTS 21 O/7) and California Lake (NTS 21 O/8) map areas; Gloucester, Northumberland, Restigouche, and Victoria counties, New Brunswick. *In* Current Research. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 93-1, pp. 121-146.

- *preliminary report*

PARKHILL, M.A. 1994. Surficial geology and till geochemistry of the Nepisiguit Lakes (NTS 21 O/7) and California Lake (NTS 21 O/8) map areas; Gloucester, Northumberland, Restigouche, and Victoria counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geoscience Report 94-3, 275 p.

- *Appendix 2 presents geochemical (Ag, Co, Cu, Fe, Mn, Ni, Pb and Zn) data for B-horizon soil samples collected from 264 sites in the O/7 map area*
- *Appendix 3 presents geochemical data, for 37 elements, for the clay fraction (<0.063μm) of 264 C-horizon till samples collected from the O/7 map area*
- *sampled on a 2 km grid (1 sample / 4 km²)*
- *for the O/7 map area, includes 4 page-size proportional dot element-distribution maps for Ag, Cu, Pb and Zn in soils; and 10 such maps for Ag, As (for two different analytical methods), Au, Cu, Hg, Pb, Sb (for two different analytical methods), and Zn (Appendix 9)*
- *Appendix 10 presents till-pebble lithology data*
- *accompanied by 1:50 000 scale Surficial Geology (Plate 93-12E), Till Geochemistry (Plates 93-12B, 93-12C and 93-12D) and Till-pebble Lithology (Plate 93-12F) maps*

PARKHILL, M.A., and DOIRON, A. 1995. Quaternary geology and glacial dispersal of sulphides at the Half Mile Lake and Restigouche deposits, Bathurst Mining Camp, northern New Brunswick - EXTECH-II. *In* Geoscience Research 1994. *Compiled and edited by* J.P. Langton. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 15, pp. 45-58.

PARKHILL, M.A., PRONK, A.G., and DOIRON, A. 1995. Surficial geology and location of till samples, Restigouche deposit area (NTS 21O/7, 8, 9, and 10), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-1.

- *1:10 000 scale map*
- *covers the northeast corner of the O/7 map area*
- *presents data on Cu, Pb, Zn, Co, Ni, Au, Ag, As, Sb, Hg, Mo, Mn, Fe, W and Sn in the till clay plus silt (<63μm) fraction (for 27 samples)*

21 O/8, California Lake

ABBOTT, D., and HERBERT, T.A. 1967. Heavy minerals in glacial deposits of the Bathurst area. New Brunswick Research and Productivity Council, Mineralogical Group, Research Note 7, 18 p.

- *includes a brief description of glacial deposit types and a 1:215 000 scale map of the surficial geology of parts of the O/8, O/9, P/5 and P/12 map areas*

PARADIS, S., THOMAS, R.D., and RAMPTON, V.N. (TERRAIN ANALYSIS AND MAPPING SERVICES LTD.). 1986. Granular aggregate resources of Big Bald Mountain (NTS 21 O/1), Serpentine Lake (NTS 21 O/2), and California Lake (NTS 21 O/8), New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-5, 132 p.

- *includes a section on surficial geology*
- *Appendix E presents detailed descriptions of 23 surficial deposit sites*
- *Appendix F presents brief descriptions of an additional 77 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-9) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 7 identifies the 161 till sample site locations in the O/8 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6.5 km²*
- *there is a large gap in the sample pattern in the west-central part of the map area*

PARKHILL, M.A. 1990. Surficial geology and till geochemistry of the California Lake map area (NTS 21 O/8), Gloucester, Northumberland, and Restigouche counties, New Brunswick. *In* Project Summaries for 1990: Fifteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 90-2, pp. 100-106.

- *preliminary report*

PARKHILL, M.A. 1991. Surficial geology and till geochemistry of the California Lake map area (NTS 21 O/8); Gloucester, Northumberland, and Restigouche counties; New Brunswick. *In* Project Summaries for 1991: Sixteenth Annual Review of Activities. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 91-2, pp. 101-108.

- *preliminary report*

BROSTER, B.E., and PARK, A.F. 1993. Dynamic glacigenic deformation of near-surface metamorphic bedrock: Heath Steele Mines, New Brunswick. Journal of Geology, **101**: 523-530.

PARKHILL, M.A. 1993. Surficial geology and till geochemistry of the Nepisiguit Lakes (NTS 21 O/7) and California Lake (NTS 21 O/8) map areas; Gloucester, Northumberland, Restigouche, and Victoria counties, New Brunswick. *In* Current Research. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources, Information Circular 93-1, pp. 121-146.

- *preliminary report*

PARKHILL, M.A. 1994. Surficial geology and till geochemistry of the Nepisiguit Lakes (NTS 21 O/7) and California Lake (NTS 21 O/8) map areas; Gloucester, Northumberland, Restigouche, and Victoria counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geoscience Report 94-3, 275 p.

- *Appendix 2 presents geochemical (Ag, Co, Cu, Fe, Mn, Ni, Pb and Zn) data for B-horizon soil samples collected from 267 sites in the O/8 map area*
- *Appendices 4 and 5 present geochemical data, for 39 elements, for the clay fraction (<0.063μm) of 271 C-horizon till samples collected from the O/7 map area*
- *sampled on a 2 km grid (1 sample / 4 km²)*
- *for the O/8 map area, includes 4 page-size proportional dot element-distribution maps for Ag, Cu, Pb and Zn in soils; and 10 such maps for Ag (for two different analytical methods), As, Au, Cu, Hg, Pb, Sb, and Zn (for two different analytical methods) (Appendix 9)*
- *Appendix 10 presents pebble lithology data for the till samples*
- *includes the results of a detailed till and stream-sediment geochemistry survey around the Half Mile Lake massive sulphide deposit*
- *accompanied by 1:50 000 scale Surficial Geology (Plate 93-13E), Ice-flow Indicator (Plate 93-13G), Till Geochemistry (Plates 93-13B, 93-13C and 93-13D) and Till-pebble Lithology (Plate 93-13F) maps*
- *accompanied by 1:10 000 scale Till and Stream-sediment Geochemistry (Plates 93-14B and 93-14C) and Till-pebble Lithology (Plate 93-14D) maps of the Half Mile Lake area*

PARKHILL, M.A., and DOIRON, A. 1995. Quaternary geology and glacial dispersal of sulphides at the Half Mile Lake and Restigouche deposits, Bathurst Mining Camp, northern New Brunswick - EXTECH-II. *In* Geoscience Research 1994. *Compiled and edited by* J.P. Langton. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 15, pp. 45-58.

PARKHILL, M.A., PRONK, A.G., and DOIRON, A. 1995. Surficial geology and location of till samples, Restigouche deposit area (NTS 21O/7, 8, 9, and 10), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-1.

- *1:10 000 scale map*
- *covers the extreme northwest corner of the O/8 map area*
- *presents data on Cu, Pb, Zn, Co, Ni, Au, Ag, As, Sb, Hg, Mo, Mn, Fe, W and Sn in the till clay plus silt (<63μm) fraction (for 27 samples)*

21 O/9, Tetagouche Lakes

ALCOCK, F.J. 1941. Jacquet River and Tetagouche River map-areas, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 227, 46 p.

- *includes a brief section on Quaternary geology*

ABBOTT, D., and HERBERT, T.A. 1967. Heavy minerals in glacial deposits of the Bathurst area. New Brunswick Research and Productivity Council, Mineralogical Group, Research Note7, 18 p.

- *includes a brief description of glacial deposit types and a 1:215 000 scale map of the surficial geology of parts of the O/8, O/9, P/5 and P/12 map areas*

SKINNER, R. 1974. Geology of Tetagouche Lakes, Bathurst, and Nepisiguit Falls map-areas, New Brunswick, with emphasis on the Tetagouche Group (21 O/9, 21 P/12, 21 P/5). Geological Survey of Canada, Memoir 371, 133 p.

- *includes a section on glaciation*

BARNETT, D.E., BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Granular aggregate resources of the Belledune Planning District, Gloucester and Restigouche counties, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-5, 124 p.

- *Appendix B presents a description of 1 surficial deposit site in the O/9 map area*
- *accompanied by a 1:25 000 scale map (Plate 76-117) outlining the surficial aggregate deposits of the eastern third of the map area*
- *this report is superseded by FINAMORE (1979), below, for the O/9 map area*

FINAMORE, P.F. 1979. Granular aggregate resources of the Tetagouche Lakes map-area (N.T.S. 21 O/9). New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-13, 28 p.

- *includes a brief chapter on surficial geology*
- *appendix presents descriptions of 12 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plates 79-39) outlining the surficial aggregate deposits of the map area*

PRONK, A.G. 1985. Surficial geology and geochemistry of the Tetagouche Lakes map sheet (21 O/9). *In* Tenth Annual Review of Activities, Project Résumés, 1985. *Edited by* S.A. Abbott. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Information Circular 85-3, pp. 33-35.

- *preliminary report*

PRONK, A.G. 1986. Till geochemistry of Tetagouche Lakes map area (21 O/9), New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Geological Notes Series P.M. 86-216, 10 p.

- *presents geochemical data for Ag, As, Cd, Co, Cu, Fe, Mn, Mo, Ni, Pb, Sb and Zn for the clay fraction of 245 C-horizon till samples, plus similar data (less As and Cd) for 20 B-horizon soil samples collected where till could not be obtained*
- *sampled on a 2 km grid (1 sample / 4 km^2)*
- *accompanied by a 1:50 000 scale surficial geology map (Plate 86-216)*

PRONK, A.G., and BURTON, D.M. 1988. Till geochemistry as a technique for gold exploration in northern New Brunswick. CIM Bulletin, 81: No. 915, pp. 90-98.

- *a discussion of the results of till geochemistry investigations in the O/9 and O/10 map areas*

PRONK, A.G., and LAMOTHE, M. 1988. Quaternary geology, till geochemistry and gold exploration in northern New Brunswick. *In* Prospecting in Areas of Glaciated Terrain - 1988. *Edited by* D.R. MacDonald and K.A. Mills. The Canadian Institute of Mining and Metallurgy, pp. 81-101.

- *a description of the Quaternary geology and till geochemistry of the O/9, O/10, P/12 and P/13 map areas*

RUITENBERG, A.A., McCUTCHEON, S.R., WATTERS, S.E., McLEOD, M.J., BURTON, D.M., and HOY, D. 1989. Field guide to gold occurrences in New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Field Guidebook No.1, 63 p.

- *accompanied by a detailed map (Plate 89-10B, ~1:1000 scale) of soil Ag, As and Hg anomalies at Corona Corporation's Rocky Brook prospect*
- *text includes a brief comment on maximum soil values for Ag, As, Au, Hg and Sb at the Rocky Brook prospect*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 5 identifies the 29 till sample site locations in the O/9 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 36 km²*

PRONK, A.G., and PARKHILL, M.A. 1991. Surficial geology of north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25A.

- *1:100 000 scale*

PRONK, A.G., and PARKHILL, M.A. 1991. Ice-flow indicators in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25B.

- *1:100 000 scale map of glacial striae, clast fabrics and drumlinoid features*

PRONK, A.G., and PARKHILL, M.A. 1991. Location of till and soil samples in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25C.

- *1:100 000 scale sample site index map*

PRONK, A.G., and PARKHILL, M.A. 1993. Till geochemistry in the vicinity of the Murray Brook deposit (NTS21 O/9), northern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 93-333.

PARKHILL, M.A., PRONK, A.G., and DOIRON, A. 1995. Surficial geology and location of till samples, Restigouche deposit area (NTS 21 O/7, 8, 9, and 10), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-1.

- *1:10 000 scale map*
- *covers the extreme southwest corner of the O/9 map area*
- *presents data on Cu, Pb, Zn, Co, Ni, Au, Ag, As, Sb, Hg, Mo, Mn, Fe, W and Sn in the till clay plus silt (<63μm) fraction (for 27 samples)*

21 O/10, Upsalquitch Forks

BRINSMEAD, R.A. 1979. Granular aggregate resources, Upsalquitch Forks (21 O/10) and part of Nepisiguit Lakes (21 O/7) map-areas. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No.79-11, 53 p.

- *includes a chapter on glacial history*
- *appendix presents descriptions of 19 surficial deposit sites in the O/10 map area*
- *accompanied by a 1:50 000 scale map (Plate 79-40) outlining the surficial aggregate deposits of the map area*

PRONK, A.G. 1986. Surficial geology and geochemistry of Upsalquitch Forks (NTS 21 O/10). *In* Eleventh Annual Review of Activities, Project Résumés, 1986. *Edited by* S.A. Abbott. New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Information Circular 86-2, pp. 65-67.

- *preliminary report*

PRONK, A.G. 1987. Surficial geology and till geochemistry of the Upsalquitch Forks (21 O/10) map area (with emphasis on gold distribution in tills). New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geological Notes Series P.M. 87-47, 8 p.

- *accompanied by a 1:50 000 scale surficial geology map (Plate 87-47A)*
- *accompanied by 1:50 000 scale till geochemistry maps for: Au and As (Plate 87-47B); Cu, Pb, Zn, Ag and Sb (Plate 87-47C); and Co, Ni, Mn, Fe and Mo (Plate 87-47D)*
- *sampled on a 2 km grid (1 sample / 4 km^2)*

PRONK, A.G., and BURTON, D.M. 1988. Till geochemistry as a technique for gold exploration in northern New Brunswick. CIM Bulletin, 81: No. 915, pp. 90-98.

- *a discussion of the results of till geochemistry investigations in the O/9 and O/10 map areas*

PRONK, A.G., and LAMOTHE, M. 1988. Quaternary geology, till geochemistry and gold exploration in northern New Brunswick. *In* Prospecting in Areas of Glaciated Terrain - 1988. *Edited by* D.R. MacDonald and K.A. Mills. The Canadian Institute of Mining and Metallurgy, pp. 81-101.

- *a description of the Quaternary geology and till geochemistry of the 21 O/9, O/10, P/12 and P/13 map areas*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 1 identifies the 19 till sample site locations in the O/10 map area*
- *sample spacing is irregular, based on road access, with only 19 samples collected, all from the southern half of the map area (an average of ~ 1 sample / 55 km^2)*

PRONK, A.G., and PARKHILL, M.A. 1991. Surficial geology of north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25A.

- *1:100 000 scale*

PRONK, A.G., and PARKHILL, M.A. 1991. Ice-flow indicators in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25B.

- *1:100 000 scale map of glacial striae, clast fabrics and drumlinoid features*

PRONK, A.G., and PARKHILL, M.A. 1991. Location of till and soil samples in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25C.

- *1:100 000 scale sample site index map*

PARKHILL, M.A., and DOIRON, A. 1995. Quaternary geology and glacial dispersal of sulphides at the Half Mile Lake and Restigouche deposits, Bathurst Mining Camp, northern New Brunswick - EXTECH-II. *In* Geoscience Research 1994. *Compiled and edited by* J.P. Langton. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 15, pp. 45-58.

PARKHILL, M.A., PRONK, A.G., and DOIRON, A. 1995. Surficial geology and location of till samples, Restigouche deposit area (NTS21 O/7, 8, 9, and 10), New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Plate 95-1.

- *1:10 000 scale map*
- *covers the southeast corner of the O/10 map area*
- *presents data on Cu, Pb, Zn, Co, Ni, Au, Ag, As, Sb, Hg, Mo, Mn, Fe, W and Sn in the till clay plus silt (<63μm) fraction (for 27 samples)*

PARKHILL, M.A., PRONK, A.G., and FRISKE, P.W.B. 1998. A multimedia geochemical survey in the vicinity of copper skarn occurrences in the McKenzie Gulch area (parts of NTS 21 O/10, 11, and 15), northwestern New Brunswick. *In* Current Research 1997. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 98-4, pp. 25-73.

- *presents the geochemical results for 117 basal till sample sites (45 elements), 100 balsam fir twig sample sites (37 elements) and 57 humus sample sites (38 elements) in the study area*

21 O/11, Kedgwick

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 35 surficial deposit sites in the O/11 map area*
- *Appendix B presents brief descriptions of an additional 15 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-3) outlining the surficial aggregate deposits of the map area*

PARKHILL, M.A., PRONK, A.G., and FISKE, P.W.B. 1998. A multimedia geochemical survey in the vicinity of copper skarn occurrences in the McKenzie Gulch area (parts of NTS 21 O/10, 11, and 15), northwestern New Brunswick. *In* Current Research 1997. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 98-4, pp. 25-73.

- *presents the geochemical results for 117 basal till sample sites (45 elements), 100 balsam fir twig sample sites (37 elements) and 57 humus sample sites (38 elements) in the study area*

21 O/12, Gounamitz River

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 13 surficial deposit sites in the O/12 map area*
- *Appendix B presents brief descriptions of an additional 3 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-4) outlining the surficial aggregate deposits of the map area*

21 O/13, States Brook

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 10 surficial deposit sites in the O/13 map area*
- *Appendix B presents brief descriptions of an additional 5 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-5) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 O/14, Menneval

COOPER, A.J. (GARTNER LEE ASSOCIATES LTD.). 1986. Granular aggregate resources of the Kedgwick - Saint Quentin - Grand River area (N.T.S. 21 N/16, 21 O/5, 11, 12, 13, 14), northwestern New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-4, 139 p.

- *includes a section on surficial geology*
- *Appendix A presents detailed descriptions of 7 surficial deposit sites in the O/14 map area*
- *Appendix B presents brief descriptions of an additional 3 sites*
- *accompanied by a 1:50 000 scale map (Plate 86-6) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

21 O/15, Atholville (formerly Campbellton)

FINAMORE, P.F. 1979. Granular aggregate resources of the Campbellton and Escuminac map-areas, New Brunswick (N.T.S. 21 O/15 and 22 B/1). New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-12, 93 p.

- *includes a chapter on surficial geology*
- *Appendix A presents descriptions of 52 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 79-41) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

PRONK, A.G., and PARKHILL, M.A. 1988. Surficial geology and till geochemistry (Au, As, Sb, Hg, Bi, Cu, Pb, Zn, Ag, Mn, Fe, Co, Ni, Mo) of Atholville (21 O/15) map area and part of Escuminac (22 B/1) and Oak Bay (22 B/2) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geological Notes Series PM 88-10, 7 p.

- *accompanied by a 1:50 000 scale surficial geology map (Plate 88-10A), and three till geochemistry maps (Plates 88-10B, 88-10C and 88-10D)*
- *sampled on a 2 km grid (1 sample / 4 km²)*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 1 identifies the 4 till sample site locations in the O/15 map area*
- *all 4 samples were collected from the southeast corner of the map area*

PRONK, A.G., and PARKHILL, M.A. 1991. Surficial geology of north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25A.

- *1:100 000 scale*

PRONK, A.G., and PARKHILL, M.A. 1991. Ice-flow indicators in north-central New Brunswick (N.T.S. 21O/9, 10 and 15 and parts of 22B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25B.

- *1:100 000 scale map of glacial striae, clast fabrics and drumlinoid features*

PRONK, A.G., and PARKHILL, M.A. 1991. Location of till and soil samples in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25C.

- *1:100 000 scale sample site index map*

PARKHILL, M.A., PRONK, A.G., and FISKE, P.W.B. 1998. A multimedia geochemical survey in the vicinity of copper skarn occurrences in the McKenzie Gulch area (parts of NTS 21 O/10, 11, and 15), northwestern New Brunswick. *In* Current Research 1997. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 98-4, pp. 25-73.

- *presents the geochemical results for 117 basal till sample sites (45 elements), 100 balsam fir twig sample sites (37 elements) and 57 humus sample sites (38 elements) in the study area*

21 O/16, Charlo

ALCOCK, F.J. 1941. Jacquet River and Tetagouche River map-areas, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 227, 46 p.

- *includes a brief section on Quaternary geology*

GREINER, H.R. 1970. Geology of the Charlo area, 21-O/16, Restigouche County, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Map Series 70-2, 18 p.

- *includes a brief section on glaciation*

BARNETT, D.E., BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Granular aggregate resources of the Belledune Planning District, Gloucester and Restigouche counties, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-5, 124 p.

- *Appendix B presents descriptions of 18 surficial deposit sites in the O/16 map area*
- *accompanied by a 1:25 000 scale map [Plate 76-116A (formerly Plate 76-115)] outlining the surficial aggregate deposits of the eastern third of the map area*
- *this report is superseded by BRINSMEAD (1979), below, for the O/16 map area*

BRINSMEAD, R.A. 1979. Granular aggregate resources, Charlo map-area, 21 O/16. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-10, 79 p.

- *includes a chapter on glacial history*
- *appendix presents descriptions of 51 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 79-42) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the log for a borehole (3048) from the Nash Creek area, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, and Sb in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 2 identifies the 217 till sample site locations in the O/16 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 4.3 km^2*

21 P, BATHURST
1:250 000 scale map area (regional)

CHALMERS, R. 1881. On the glacial phenomena of the Bay Chaleur region. The Canadian Naturalist, **x**: No. 1, pp. 37-54.

- *includes a listing of glacial striae sites, and descriptions of various types of glacial deposits*

CHALMERS, R. 1882. On the surface geology of the Baie des Chaleur region. The Canadian Naturalist, **x**: No. 4, pp. 193-212.

- *includes a listing of more glacial striae sites, and further descriptions of various types of glacial deposits*

CHALMERS, R. 1887. Report to accompany quarter-sheet maps 3 S.E. and 3 S.W.: surface geology, northern New Brunswick and southeastern Quebec. Geological and Natural History Survey of Canada, Annual Report, **II** (1886): Part M, 39 p.

- *includes a brief table of glacial striae sites, and descriptions of various types of glacial deposits*
- *Map 3 S.E. (1:253 440 scale) covers the western 60% of the northern 40% of the 21 P map area*

CHALMERS, R. 1887. On the glaciation and Pleistocene subsidence of northern New Brunswick and southeastern Quebec. Royal Society of Canada, Transactions, **IV**: series III, Section 4, pp. 139-145.

CHALMERS, R. 1888. Report on the surface geology of north-eastern New Brunswick, to accompany quarter-sheet maps 2 N.E. and 6 S.W. Geological and Natural History Survey of Canada, Annual Report, **III** (1887-88): Part N, 33 p.

- *includes a table reporting striae from one site in the 21 P map area, and descriptions of various types of glacial deposits*
- *Map 2 N.E. (1:253 440 scale) covers the southern 60% of the New Brunswick part of the 21 P map area*
- *Map 6 S.W. (1:253 440 scale) covers the northeastern part of the 21 P map area*

ALCOCK, F.J. 1935. Geology of Chaleur Bay region. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 183, 146 p.

- *includes sections on Quaternary geology and on the effects of glaciation*

PRESANT, E.W. 1966. A trace element study of podzol soils, Bathurst district, New Brunswick. *In* Symposium on Geochemical Prospecting. *Edited by* E.M. Cameron. Geological Survey of Canada, Paper 66-54, pp. 222-232.

- *an investigation of the distribution of Cu, Pb, Zn, Fe, Mn, As, Sb, Ag, Sn and Cd in soils profiles from a number of sites in the Bathurst camp*

AIRPHOTO ANALYSIS ASSOCIATES CONSULTANTS LIMITED. 1975. Beach resources, eastern New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Miscellaneous Report 2, 215 p.

- *includes a section on "Surficial Geology"*
- *accompanied by a 1:1 000 000 scale map of the surficial geology of the coastal part of eastern New Brunswick*

LOHSE, H. 1976. Granular resources of the Tracadie centred region. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-4, 13 p.

- *includes a brief section on Pleistocene Geology*
- *accompanied by a 1:250 000 scale map (Plate 75-164) identifying the locations of sampled pits and outlining the distribution of marine shallow-water deposits (eastern part of the area only)*

GAUTHIER, R.C., and CORMIER, V. 1977. Cartographie des dépôts superficiels, péninsule nord-est du Nouveau-Brunswick. *In* Report of Activities, Part A. Geological Survey of Canada, Paper 77-1A, pp. 371-378.

- *covers the western and northern parts of the 21 P map area, comprising the areas covered by 1:50 000 scale map areas P/4, P/5, P/11, P/12, P/13 and P/14*

GAUTHIER, R.C. 1978. Quelques interprétations de l'inventaire des dépôts de surface, péninsule nord-est du Nouveau-Brunswick. *In* Current Research, Part A. Geological Survey of Canada, Paper 78-1A, pp. 409-412.

GAUTHIER, R.C. 1982. Surficial deposits, northern New Brunswick. Geological Survey of Canada, Open File 856.

- *1:100 000 scale maps 21 P/NW, NE and 21 P/S cover the 21 P map area*

GAUTHIER, R.C. 1983. Surficial materials of northern New Brunswick. Geological Survey of Canada, Open File 963.

LAMOTHE, M. 1988. Till geochemistry over the northern part of the Miramichi Zone and vicinity: a progress report. Geological Survey of Canada, Open File 1909.

- *preliminary report, superseded by GSC Open File 2236*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *covers the western quarter of the of the northern three-quarters of the 21 P map area*
- *sample spacing is irregular, based on road access*
- *accompanied by eleven 1:500 000 scale proportional dot (range) plots for Cu, Pb, Zn, Sn, W, As, U, and Hg in the clay fraction and As, Au and Sb in the silt plus clay fraction*

LAMOTHE, M. 1992. Pleistocene stratigraphy and till geochemistry of the Miramichi Zone, New Brunswick. Geological Survey of Canada, Bulletin 433, 58 p.

- *accompanied by colour plots of regional abundances of Cu, Hg, Pb, Sb, Sn, U, W and Zn in the clay fraction of tills (mud fraction for Sb)*

21 P/2, Point Escuminac

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213p.

- *includes a section on Quaternary geology*
- *accompanied by a 1:50 000 scale map (Plate 85-43) outlining the surficial aggregate deposits of the map area*

21 P/3, Chatham

SEAMAN, A. 1985. Surficial geology, Town of Chatham, N.B. New Brunswick Department of Natural Resources, Mineral Resources Division, Plate 85-7.

- *1:10 000 scale map of the municipal area*

SEAMAN, A.A., and THIBAULT, J. 1986. Granular aggregate resources of the Central Lowland area, east-central New Brunswick. New Brunswick Department of Forests, Mines and Energy, Mineral Resources Division, Open File Report 86-1, 213 p.

- *includes a section on Quaternary geology*
- *Appendix N presents descriptions of 14 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 85-44) outlining the surficial aggregate deposits of the map area*

21 P/4, Sevogle

SHAW, E.W. 1936. Little Southwest Miramichi - Sevogle rivers area, New Brunswick. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 197, 15 p.

- *includes a very brief section on Pleistocene geology*

BRINSMEAD, R.A. 1978. Granular aggregate resources of Sevogle map-area. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 78-10, 97 p.

- *includes a chapter on glacial history*
- *Appendix B presents descriptions of 57 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 78-24) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Till geochemistry over the central Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2237, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 5 identifies the 46 till sample site locations in the P/4 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 11.5 km^2 (west half of the map area only)*

DOIRON, A., and BOISVERT, É. 1999. La géochimie des tills de la région de Sevogle (SNRC 21 P/04, moitié ouest), comtés de Northumberland et Gloucester, Nouveau-Brunswick / Till geochemistry of the Sevogle area (NTS 21 P/04, west half), Northumberland and Gloucester counties, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-3, 139 p.

- *presents geochemical data for 37 elements for C-horizon till samples collected from 124 sites*
- *sampled on a 2 km grid (1 sample / 4km²)*
- *includes 43 page-size proportional dot (range) plots of the map area for the 37 elements (Ba, Co, Cr, Ni, Rb and Zr were analyzed by two different methods)*
- *includes a chapter on Quaternary Geology*
- *accompanied by four 1:50 000 scale till geochemistry maps (Plates 99-6, 99-7, 99-8 and 99-9)*

21 P/5, Nepisiguit Falls

ABBOTT, D., and HERBERT, T.A. 1967. Heavy minerals in glacial deposits of the Bathurst area. New Brunswick Research and Productivity Council, Mineralogical Group, Research Note 7, 18 p.

- *includes a brief description of glacial deposit types and a 1:215 000 scale map of the surficial geology of parts of the O/8, O/9, P/5 and P/12 map areas*

SKINNER, R. 1974. Geology of Tetagouche Lakes, Bathurst, and Nepisiguit Falls map-areas, New Brunswick, with emphasis on the Tetagouche Group (21 O/9, 21 P/12, 21 P/5). Geological Survey of Canada, Memoir 371, 133 p.

- *includes a section on glaciation*

KINGSTON, P.W. 1975. Surficial geology of the Pabineau Lake area, Gloucester County. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 75-138.

- *1:50 000 scale map of ~180 km² in the north-central part of the P/5 map area and ~115 km² in the south-central part of the P/12 map area*

THIBAULT, J. 1978. Granular aggregate resources, Nepisiguit Falls map-area, 21 P/5. New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 78-4, 81 p.

- *includes a section on surficial geology*
- *Appendix C presents descriptions of 49 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 78-19) outlining the surficial aggregate deposits of the map area*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for two boreholes (3037 and 3038) from the Middle Landing area, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, and Sb in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 8 identifies the 103 till sample site locations in the P/5 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 6 km² (west half of the map area), and ~ 1 sample / 35 km² (east half of the map area)*

PARKHILL, M.A. 1994. Surficial geology and till geochemistry in northern New Brunswick: summary of projects and current database. *In* Current Research 1993. *Compiled and edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 12, pp. 129-146.

- *contains a summary of till geochemistry projects carried out in northern New Brunswick*
- *includes a report on work on the surficial geology of the area of the Captain North Extension deposit, in the P/5W area*

PARKHILL, M.A., and DOIRON, A. 1995. Surficial geology and till geochemistry near the Captain North Extension (CNE) massive sulphide deposit, northern New Brunswick. *In* Current Research 1994. *Compiled and edited by* S.A.A. Merlini. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Miscellaneous Report 18, pp. 165-203.

PARKHILL, M.A. 1997. Surficial geology and till geochemistry in northern New Brunswick: summary of EXTECH-II projects and current database. *In* Current Research 1996. *Edited by* B.M.W. Carroll. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Mineral Resource Report 97-4, pp. 201-223.

- *includes a summary of the glacial history and geology of the west half of the map area*

PARKHILL, M.A., and DICKSON, M.L. 1999. Till geochemistry of the Nepisiguit Falls map area (NTS 21 P/05), Gloucester and Northumberland counties, northern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File 99-10, 108 p.

- *Appendices 2 and 3 present geochemical data for 54 elements from the silt-plus-clay fraction (<63 µm) of 279 samples, mostly C-horizon basal till*
- *Appendix 4 presents pebble lithology, grain size and site characteristics data*
- *sampled on a 2 km grid (1 sample / 4 km²)*
- *includes a chapter on Quaternary Geology*
- *accompanied by a 1:50 000 scale site location and ice-flow indicators map (Plate 99-27A)*

21 P/6, Tabusintac River

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix A presents detailed descriptions of 8 surficial deposit sites and brief descriptions of 17 additional sites in the P/6 map area*
- *accompanied by a 1:50 000 scale map (Plate 86-223) outlining the surficial aggregate deposits of the map area*

21 P/7, Wishart Point

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix A presents brief descriptions of 8 surficial deposit sites in the P/7 map area*
- *accompanied by a 1:50 000 scale map (Plate 86-223) outlining the surficial aggregate deposits of the map area*

21 P/10, Tracadie

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix B presents a detailed description of 1 surficial deposit site and brief descriptions of 21 others*
- *accompanied by a 1:50 000 scale map (Plate 86-224) outlining the surficial aggregate deposits of the map area*

21 P/11, Burnsville

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix C presents detailed descriptions of 9 surficial deposit sites and brief descriptions of 29 others*
- *accompanied by a 1:50 000 scale map (Plate 86-225) outlining the surficial aggregate deposits of the map area*

21 P/12, Bathurst

PAISLEY, Rev. C.H. 1875. Notes on the marine clays occurring at the railway cutting on the left bank of the Tattagouche River. The Canadian Naturalist, vii: New Series, No.1, pp. 41-43.

PAISLEY, Rev. C.H. 1875. On the post-Pliocene formation near Bathurst, New Brunswick. The Canadian Naturalist, vii: New Series, No.5, pp. 268-270.

YOUNG, G.A. 1911. Bathurst District, New Brunswick. Canada Department of Mines, Geological Survey Branch, Memoir No.18-E, 96 p.

- *includes a section on Quaternary geology*

ALCOCK, F.J. 1941. Jacquet River and Tetagouche River map-areas, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 227, 46 p.

- *includes a brief section on Quaternary geology*

ABBOTT, D., and HERBERT, T.A. 1967. Heavy minerals in glacial deposits of the Bathurst area. New Brunswick Research and Productivity Council, Mineralogical Group, Research Note 7, 18 p.

- *includes a brief description of glacial deposit types and a 1:215 000 scale map of the surficial geology of parts of the O/8, O/9, P/5 and P/12 map areas*

SKINNER, R. 1974. Geology of Tetagouche Lakes, Bathurst, and Nepisiguit Falls map-areas, New Brunswick, with emphasis on the Tetagouche Group (21 O/9, 21 P/12, 21 P/5). Geological Survey of Canada, Memoir 371, 133 p.

- *includes a section on glaciation*

KINGSTON, P.W. 1975. Surficial geology of the Pabineau Lake area, Gloucester County. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 75-138.

- *1:50 000 scale map of ~180 km² in the north-central part of the P/5 map area and ~115 km² in the south-central part of the P/12 map area*

CHANDRA, J. 1976. Seismic surveys carried out in Camp Utopia, Pennfield Ridge, Pocologan Station, Blagdon (Nerepis) and Rocky Brook (Pabineau) areas of New Brunswick in 1975 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 76-7, 35 p.

- *presents inferred seismic sections for the Rocky Brook outwash deposit, with a brief description of the glacial geology*

BARNETT, D.E., BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Granular aggregate resources of the Belledune Planning District, Gloucester and Restigouche counties, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-5, 124 p.

- *Appendix B presents descriptions of 34 surficial deposit sites in the P/12 map area*
- *accompanied by 1:25 000 scale maps [Plates 76-116C and 76-116D (formerly 76-117 and 76-118)] outlining the surficial aggregate deposits of the western three-quarters of the map area*
- *this report is superseded by FINAMORE (1978), below, for the P/12 map area*

FINAMORE, P.F. 1978. Granular aggregate resources, the Bathurst map-area (N.T.S. 21 P/12). New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 78-8, 100 p.

- *includes a chapter on surficial geology*
- *Appendix A presents descriptions of 74 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 78-23) outlining the surficial aggregate deposits of the map area*

PRONK, A.G., and LAMOTHE, M. 1988. Quaternary geology, till geochemistry and gold exploration in northern New Brunswick. *In* Prospecting in Areas of Glaciated Terrain - 1988. *Edited by* D.R. MacDonald and K.A. Mills. The Canadian Institute of Mining and Metallurgy, pp. 81-101.

- *a description of the Quaternary geology and till geochemistry of the O/9, O/10, P/12 and P/13 map areas*

LAMOTHE, M. 1990. Overburden drilling program in the Saint John valley and the Baie des Chaleurs coastal area of northern New Brunswick: till geochemistry and borehole logs. Geological Survey of Canada, Open File 2149, 84 p.

- *presents the logs for four boreholes (3039 - 3042) from the Bathurst area and one (3049) from the Nigadoo area, with geochemical data for As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Ni, Pb, Sn, U, W and Zn in the clay fraction and As, Au, and Sb in the silt plus clay fraction*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 4 identifies the 179 till sample site locations in the P/12 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 3 km² (west half of the map area); only 6 samples were collected from the east half of the map area*

21 P/13, Pointe Verte

YOUNG, G.A. 1911. Bathurst District, New Brunswick. Canada Department of Mines, Geological Survey Branch, Memoir No.18-E, 96 p.

- *includes a section on Quaternary geology*

ALCOCK, F.J. 1941. Jacquet River and Tetagouche River map-areas, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 227, 46 p.

- *includes a brief section on Quaternary geology*

GREINER, H.R. 1960. Pointe Verte, Gloucester and Restigouche counties. New Brunswick Department of Lands and Mines, Mines Branch, Geological Notes P.M.60-2, 35 p.

- *includes a section on Pleistocene geology*

KINGSTON, P.W. 1974. Surficial geology and granular resources of part of Point Verte West, 21 P/13 W. New Brunswick Department of Natural Resources, Mineral Resources Branch, Plate 74-119.

- *1:50 000 scale surficial geology map of the Belledune Lake esker (an area of ~20 km²), in the west-central part of the map area*

CHANDRA, J., BRINSMEAD, R., and BANCROFT, D. 1975. Seismic surveys carried out in northern, eastern and southern New Brunswick in 1974 for the purpose of determining sand and gravel thicknesses. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 75-11, 47 p.

- *presents a description of the surficial deposits in the Belledune esker area, accompanied by a page size surficial geology map (~1:62 000 scale)*

BARNETT, D.E., BRINSMEAD, R.A., and FINAMORE, P.F. 1977. Granular aggregate resources of the Belledune Planning District, Gloucester and Restigouche counties, New Brunswick. New Brunswick Department of Natural Resources, Mineral Resources Branch, Topical Report 77-5, 124 p.

- *Appendix B presents descriptions of 21 surficial deposit sites in the P/13 map area*
- *accompanied by 1:25 000 scale maps [Plates 76-116A and 76-116B (formerly 76-116 and 76-115)] outlining the surficial aggregate deposits of the map area*

PRONK, A.G., and LAMOTHE, M. 1988. Quaternary geology, till geochemistry and gold exploration in northern New Brunswick. *In* Prospecting in Areas of Glaciated Terrain - 1988. *Edited by* D.R. MacDonald and K.A. Mills. The Canadian Institute of Mining and Metallurgy, pp. 81-101.

- *a description of the Quaternary geology and till geochemistry of the O/9, O/10, P/12 and P/13 map areas*

LAMOTHE, M. 1990. Till geochemistry over the northern Miramichi Zone and vicinity, New Brunswick. Geological Survey of Canada, Open File 2236, 88 p.

- *presents geochemical data for Ag, As, Co, Cr, Cu, F, Fe, Hg, Mn, Mo, Na, Ni, Pb, Sn, U, W and Zn analysed on the clay fraction, and for As, Au and Sb analysed on the silt plus clay fraction*
- *Plate 3 identifies the 191 till sample site locations in the P/13 map area*
- *sample spacing is irregular, based on road access, with an average of ~ 1 sample / 1.5 km²*

21 P/14, Grand-Anse

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix D presents detailed descriptions of 5 surficial deposit site and brief descriptions of 7 others*
- *accompanied by a 1:50 000 scale map (Plate 86-226) outlining the surficial aggregate deposits of the map area*

21 P/15, Caraquet

THIBAULT, J. 1987. Granular aggregate resources of the Acadian Peninsula, northeastern New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Open File Report 87-2, 31 p.

- *includes a brief chapter on surficial geology*
- *Appendix E presents detailed descriptions of 5 surficial deposit site and brief descriptions of 10 others*
- *accompanied by a 1:50 000 scale map (Plate 86-227) outlining the surficial aggregate deposits of the map area*

22 B, MATANE
1:250 000 scale map area (regional)

CHALMERS, R. 1887. Report to accompany quarter-sheet maps 3 S.E. and 3 S.W.: surface geology, northern New Brunswick and southeastern Quebec. Geological and Natural History Survey of Canada, Annual Report, II (1886): Part M, 39 p.

- *includes a brief table of glacial striae sites, and descriptions of various types of glacial deposits*
- *Map 3 S.W. (1:253 440 scale) covers the New Brunswick part of the 22 B map area*

CHALMERS, R. 1887. On the glaciation and Pleistocene subsidence of northern New Brunswick and southeastern Quebec. Royal Society of Canada, Transactions, IV: series III, Section 4, pp. 139-145.

ALCOCK, F.J. 1935. Geology of Chaleur Bay region. Canada Department of Mines, Bureau of Economic Geology, Geological Survey, Memoir 183, 146 p.

- *includes sections on Quaternary geology and on the effects of glaciation*

GAUTHIER, R.C. 1982. Surficial deposits, northern New Brunswick. Geological Survey of Canada, Open File 856.

- *1:100 000 scale map 22 B covers the New Brunswick part of the 22 B map area*

GAUTHIER, R.C. 1983. Surficial materials of northern New Brunswick. Geological Survey of Canada, Open File 963.

22 B/1, Escuminac; B/2, Oak Bay

ALCOCK, F.J. 1941. Jacquet River and Tetagouche River map-areas, New Brunswick. Canada Department of Mines and Resources, Mines and Geology Branch, Geological Survey Memoir 227, 46 p.

- *includes a brief section on Quaternary geology*

FINAMORE, P.F. 1979. Granular aggregate resources of the Campbellton and Escuminac map-areas, New Brunswick (N.T.S. 21 O/15 and 22 B/1). New Brunswick Department of Natural Resources, Mineral Resources Branch, Open File Report No. 79-12, 93 p.

- *includes a chapter on surficial geology*
- *Appendix B presents descriptions of 6 surficial deposit sites*
- *accompanied by a 1:50 000 scale map (Plate 79-61) outlining the surficial aggregate deposits of the New Brunswick part of the map area*

PRONK, A.G., and PARKHILL, M.A. 1988. Surficial geology and till geochemistry (Au, As, Sb, Hg, Bi, Cu, Pb, Zn, Ag, Mn, Fe, Co, Ni, Mo) of Atholville (21 O/15) map area and part of Escuminac (22 B/1) and Oak Bay (22 B/2) map areas, New Brunswick. New Brunswick Department of Natural Resources and Energy, Minerals and Energy Division, Geological Notes Series PM 88-10, 7 p.

- *accompanied by a 1:50 000 scale surficial geology map (Plate 88-11A), and three till geochemistry maps (Plates 88-11B, 88-11C and 88-11D)*
- *sampled on a 2 km grid (1 sample / 4 km^2)*

PRONK, A.G., and PARKHILL, M.A. 1991. Surficial geology of north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25A.

- *1:100 000 scale*

PRONK, A.G., and PARKHILL, M.A. 1991. Ice-flow indicators in north-central New Brunswick (N.T.S. 21O/9, 10 and 15 and parts of 22B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25B.

- *1:100 000 scale map of glacial striae, clast fabrics and drumlinoid features*

PRONK, A.G., and PARKHILL, M.A. 1991. Location of till and soil samples in north-central New Brunswick (N.T.S. 21 O/9, 10 and 15 and parts of 22 B/1 and 2). New Brunswick Department of Natural Resources and Energy, Mineral Resources Division, Plate 91-25C.

- *1:100 000 scale sample site index map*